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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

July 2001

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CONTENTS

1. Introduction

2. Global Data Monitoring Statistics

3. Composite Observing Systems for the North Atlantic (COSNA)

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1A, 1B, 2A and 2B contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Bracknell and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.

TABLE 1A

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: July 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed ($m\ s^{-1}$).
:Wind direction (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 $m\ s^{-1}$ (vector wind)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 $m\ s^{-1}$	(wind speed),
	≥ 30 degrees	(direction).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
3.PGE	≥ 25	

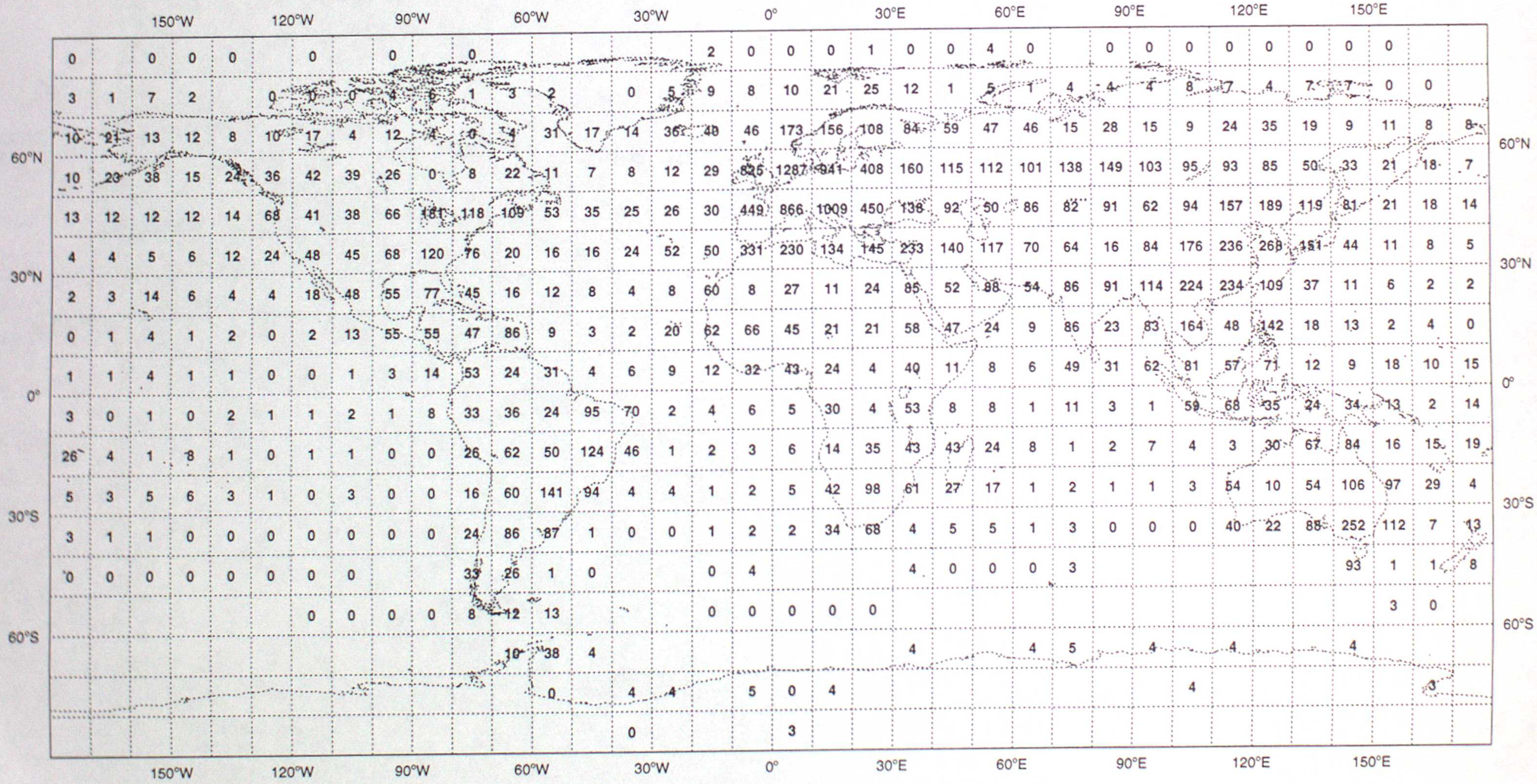
N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
AVOSTEST	ALL	P	SUR	26	25	96	0.0	-13.9	13.9
BOAB	ALL	P	SUR	60	0	0	2.8	-4.5	5.3
CG2960	ALL	P	SUR	101	71	70	0.8	2.2	2.3
C6LU3	ALL	P	SUR	38	0	0	1.6	4.6	4.9
ELAQ5	ALL	P	SUR	22	0	0	0.8	4.4	4.5
ELJL8	ALL	P	SUR	34	0	0	1.0	7.6	7.7
ELWR	ALL	P	SUR	38	0	0	0.9	-9.5	9.6
FGTO	ALL	P	SUR	103	16	16	7.0	-2.2	7.3
H3EP	ALL	P	SUR	55	0	0	0.9	-6.7	6.8
KHRP	ALL	P	SUR	33	0	0	2.9	5.9	6.5
PECF	ALL	P	SUR	40	1	2	3.3	-5.2	6.1
UBAW	ALL	P	SUR	63	3	5	7.3	1.1	7.4
UBDL	ALL	P	SUR	21	0	0	6.6	-3.1	7.3
UBDP	ALL	P	SUR	25	4	16	4.0	5.7	7.0
UCTI	ALL	P	SUR	28	7	25	1.4	-12.5	12.6
UCTQ	ALL	P	SUR	49	16	33	4.2	-4.5	6.1
UCTS	ALL	P	SUR	44	0	0	3.7	-9.2	9.9
UFAA	ALL	P	SUR	37	0	0	4.0	-4.7	6.2
VCRT	ALL	P	SUR	24	0	0	1.1	-4.6	4.7
VVMA	ALL	P	SUR	54	0	0	1.6	4.2	4.5
WUW2120	ALL	P	SUR	34	30	88	1.4	-8.5	8.7
4XGV	ALL	P	SUR	38	0	0	0.8	6.6	6.6
62137	ALL	P	SUR	56	0	0	1.7	-4.9	5.2
62151	ALL	P	SUR	26	0	0	0.7	7.1	7.1
WIND SPEED									
DMRX	ALL	SPEED	SUR	36	0	0	5.3	6.7	8.5
DNHS	ALL	SPEED	SUR	25	0	0	4.5	5.8	7.4
ELUT5	ALL	SPEED	SUR	42	0	0	4.8	5.0	6.9
ELWP8	ALL	SPEED	SUR	37	0	0	4.9	9.2	10.4
JKPS	ALL	SPEED	SUR	25	1	4	2.5	5.8	6.3
KHJB	ALL	SPEED	SUR	21	0	0	5.2	6.7	8.5
LAOM4	ALL	SPEED	SUR	34	0	0	6.1	10.0	11.7
MXAR9	ALL	SPEED	SUR	43	0	0	7.3	6.8	9.9
OWRN2	ALL	SPEED	SUR	44	2	5	4.7	8.5	9.7
PJIB	ALL	SPEED	SUR	25	1	4	7.6	5.8	9.6
SFRZ	ALL	SPEED	SUR	46	0	0	5.6	7.1	9.0
SK000	ALL	SPEED	SUR	68	3	4	6.2	7.1	9.5
S6JM	ALL	SPEED	SUR	73	32	44	7.3	5.2	9.0
S6JT	ALL	SPEED	SUR	39	1	3	4.7	5.4	7.2
VNNM	ALL	SPEED	SUR	43	1	2	4.4	5.0	6.6
VTZJ	ALL	SPEED	SUR	22	0	0	1.8	-5.2	5.5
V7AV6	ALL	SPEED	SUR	51	0	0	2.2	-5.9	6.3
3ESP7	ALL	SPEED	SUR	60	2	3	4.2	7.7	8.8
3FGR5	ALL	SPEED	SUR	31	0	0	5.4	7.1	9.0
44145	ALL	SPEED	SUR	241	0	0	3.9	5.4	6.7
9MBX5	ALL	SPEED	SUR	21	0	0	3.8	5.2	6.5
WIND DIRECTION									
BBXX SK0	ALL	DIRN.	SUR	38	1	3	80.4	15.5	81.9
DGNB	ALL	DIRN.	SUR	253	0	0	95.9	-10.3	96.5
ELPT3	ALL	DIRN.	SUR	30	0	0	95.6	-21.5	98.0
SK005	ALL	DIRN.	SUR	51	1	2	97.6	13.0	98.5
UIAI	ALL	DIRN.	SUR	34	0	0	75.4	52.0	91.5

Figure 1. SHIP/SYNOP mean daily count. JULY 2001

Main hours only

Global average number of observations in 24 hours = 21604



0		0	0	0		0		0		0						2	0	0	0	1	0	0	4	0		0	0	0	0	0	0	0	0		
3	1	7	2		0	0	0	4	6	1	3	2		0	5	9	8	10	21	25	12	1	5	1	4	4	4	8	7	4	7	7	0	0	
10	21	13	12	8	10	17	4	12	4	0	4	31	17	14	36	40	46	173	156	108	84	59	47	46	15	28	15	9	24	35	19	9	11	8	8
10	23	38	15	24	36	42	39	26	0	8	22	11	7	8	12	29	825	1287	941	408	160	115	112	101	138	149	103	95	93	85	50	33	21	18	7
13	12	12	12	14	68	41	38	66	181	118	109	53	35	25	26	30	449	866	1009	450	138	92	50	86	82	91	62	94	157	189	119	81	21	18	14
4	4	5	6	12	24	48	45	68	120	76	20	16	16	24	52	50	331	230	134	145	233	140	117	70	64	16	84	176	236	268	151	44	11	8	5
2	3	14	6	4	4	18	48	55	77	45	16	12	8	4	8	60	8	27	11	24	85	52	88	54	86	91	114	224	234	109	37	11	6	2	2
0	1	4	1	2	0	2	13	55	55	47	86	9	3	2	20	62	66	45	21	21	58	47	24	9	86	23	83	164	48	142	18	13	2	4	0
1	1	4	1	1	0	0	1	3	14	53	24	31	4	6	9	12	32	43	24	4	40	11	8	6	49	31	62	81	57	71	12	9	18	10	15
3	0	1	0	2	1	1	2	1	8	33	36	24	95	70	2	4	6	5	30	4	53	8	8	1	11	3	1	59	68	35	24	34	13	2	14
26	4	1	8	1	0	1	1	0	0	26	62	50	124	46	1	2	3	6	14	35	43	43	24	8	1	2	7	4	3	30	67	84	16	15	19
5	3	5	6	3	1	0	3	0	0	16	60	141	94	4	4	1	2	5	42	98	61	27	17	1	2	1	1	3	54	10	54	106	97	29	4
3	1	1	0	0	0	0	0	0	0	24	86	87	1	0	0	1	2	2	34	68	4	5	5	1	3	0	0	0	40	22	88	252	112	7	13
0	0	0	0	0	0	0	0			33	26	1	0			0	4				4	0	0	0	3							93	1	1	8
						0	0	0	0	8	12	13				0	0	0	0	0													3	0	
											10	38	4								4			4	5		4		4			4			
												0		4	4		5	0	4									4						3	
														0				3																	

TABLE 1B

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: July 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times :00, 06, 12, 18 UTC

Element monitored :Sea temperature (Degrees C).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :10 degrees

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias| ≥ 3 degrees

2.SD ≥ 5 degrees

3.PGE ≥ 25

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
SEA SURFACE TEMPERATURE									
BBXX SK0	ALL	TS	SUR	163	140	86	1.3	0.4	1.4
CFD3659	ALL	TS	SUR	89	2	2	3.3	3.6	4.9
CG2248	ALL	TS	SUR	66	63	95	0.6	0.5	0.8
CG2960	ALL	TS	SUR	100	27	27	2.2	2.5	3.4
C6FD8	ALL	TS	SUR	22	0	0	1.4	-3.1	3.4
C6MS4	ALL	TS	SUR	37	0	0	0.8	-4.0	4.1
DQVO	ALL	TS	SUR	76	0	0	1.6	4.3	4.6
ELGN6	ALL	TS	SUR	22	0	0	0.4	3.0	3.0
ELJL8	ALL	TS	SUR	33	4	12	1.6	4.3	4.6
ELKU8	ALL	TS	SUR	25	0	0	2.7	3.1	4.1
H9GW	ALL	TS	SUR	37	0	0	1.1	3.8	4.0
JADY	ALL	TS	SUR	37	0	0	0.8	5.8	5.9
KIOH	ALL	TS	SUR	51	0	0	1.0	-4.5	4.6
KRHX	ALL	TS	SUR	49	1	2	1.6	-3.8	4.1
KRPB	ALL	TS	SUR	61	0	0	1.0	-5.1	5.2
KUU619	ALL	TS	SUR	26	21	81	1.5	7.0	7.1
LF5T	ALL	TS	SUR	159	83	52	0.9	-0.2	0.9
MVXQ8	ALL	TS	SUR	25	0	0	0.9	-4.7	4.8
MZGK7	ALL	TS	SUR	40	9	22	3.3	-6.2	7.0
NLGF	ALL	TS	SUR	30	0	0	1.5	3.4	3.7
OUGV	ALL	TS	SUR	23	1	4	2.4	3.7	4.4
PDYI	ALL	TS	SUR	50	0	0	0.5	-3.9	3.9
PGRE	ALL	TS	SUR	22	1	5	1.3	-6.3	6.4
PPSV	ALL	TS	SUR	45	0	0	3.0	-3.3	4.5
SFRZ	ALL	TS	SUR	46	46	100			
SGIX	ALL	TS	SUR	34	0	0	1.5	5.5	5.7
SKWI	ALL	TS	SUR	23	8	35	0.4	-0.5	0.7
SK005	ALL	TS	SUR	180	180	100			
TSMS	ALL	TS	SUR	47	0	0	0.9	-3.6	3.7
UCBP	ALL	TS	SUR	46	0	0	1.7	-3.6	3.9
UCNK	ALL	TS	SUR	26	0	0	2.1	-3.0	3.6
VGLZ	ALL	TS	SUR	33	33	100			
VJIK	ALL	TS	SUR	45	15	33	1.4	-2.6	3.0
WTEF	ALL	TS	SUR	70	0	0	1.3	-3.1	3.3
WZJD	ALL	TS	SUR	54	0	0	0.6	-3.2	3.3
ZCBV4	ALL	TS	SUR	52	19	37	1.0	0.2	1.0
3ECM7	ALL	TS	SUR	93	0	0	1.1	3.1	3.3
3FDV6	ALL	TS	SUR	44	0	0	1.0	3.3	3.4
45002	ALL	TS	SUR	248	0	0	1.6	3.8	4.1
45141	ALL	TS	SUR	339	339	100			
45145	ALL	TS	SUR	638	638	100			
45147	ALL	TS	SUR	738	738	100			
45148	ALL	TS	SUR	741	741	100			
45150	ALL	TS	SUR	334	334	100			
45152	ALL	TS	SUR	739	739	100			
45154	ALL	TS	SUR	739	0	0	1.6	3.5	3.9
46131	ALL	TS	SUR	736	736	100			
46146	ALL	TS	SUR	739	739	100			
46181	ALL	TS	SUR	739	739	100			
48011	ALL	TS	SUR	334	172	51	1.7	6.8	7.0
63116	ALL	TS	SUR	26	0	0	0.8	-3.2	3.3
9VWW	ALL	TS	SUR	162	1	1	1.4	4.8	5.0

TABLE 2A

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: July 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA : NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
21604	25.4	-79.9	ALL	P	SUR	100	100	100			
21613	38.3	-77.1	ALL	P	SUR	30	30	100			
21628	38.3	-77.0	ALL	P	SUR	25	25	100			
25540	81.3	104.7	ALL	P	SUR	406	396	98	0.2	-3.1	3.1
25565	43.1	-86.1	ALL	P	SUR	178	178	100			
41504	23.2	-64.6	ALL	P	SUR	145	137	94	5.1	-6.4	8.2
46561	31.1	-169.4	ALL	P	SUR	236	0	0	0.6	-5.3	5.3
56808	24.9	-81.3	ALL	P	SUR	112	112	100			
WIND SPEED											
17557	-32.0	88.7	ALL	SPEED	SUR	693	0	0	2.9	-5.4	6.2
41639	25.2	-63.9	ALL	SPEED	SUR	198	1	1	4.4	5.8	7.3
52522	33.3	-167.8	ALL	SPEED	SUR	176	1	1	1.4	-5.2	5.3
WIND DIRECTION											
52526	14.0	151.2	ALL	DIRN.	SUR	22	0	0	24.6	30.8	39.5
52534	18.7	142.0	ALL	DIRN.	SUR	155	0	0	20.7	30.7	37.0

Figure 2. DRIFTER mean daily count. JULY 2001
Main hours only
Global average number of observations in 24 hours = 9385

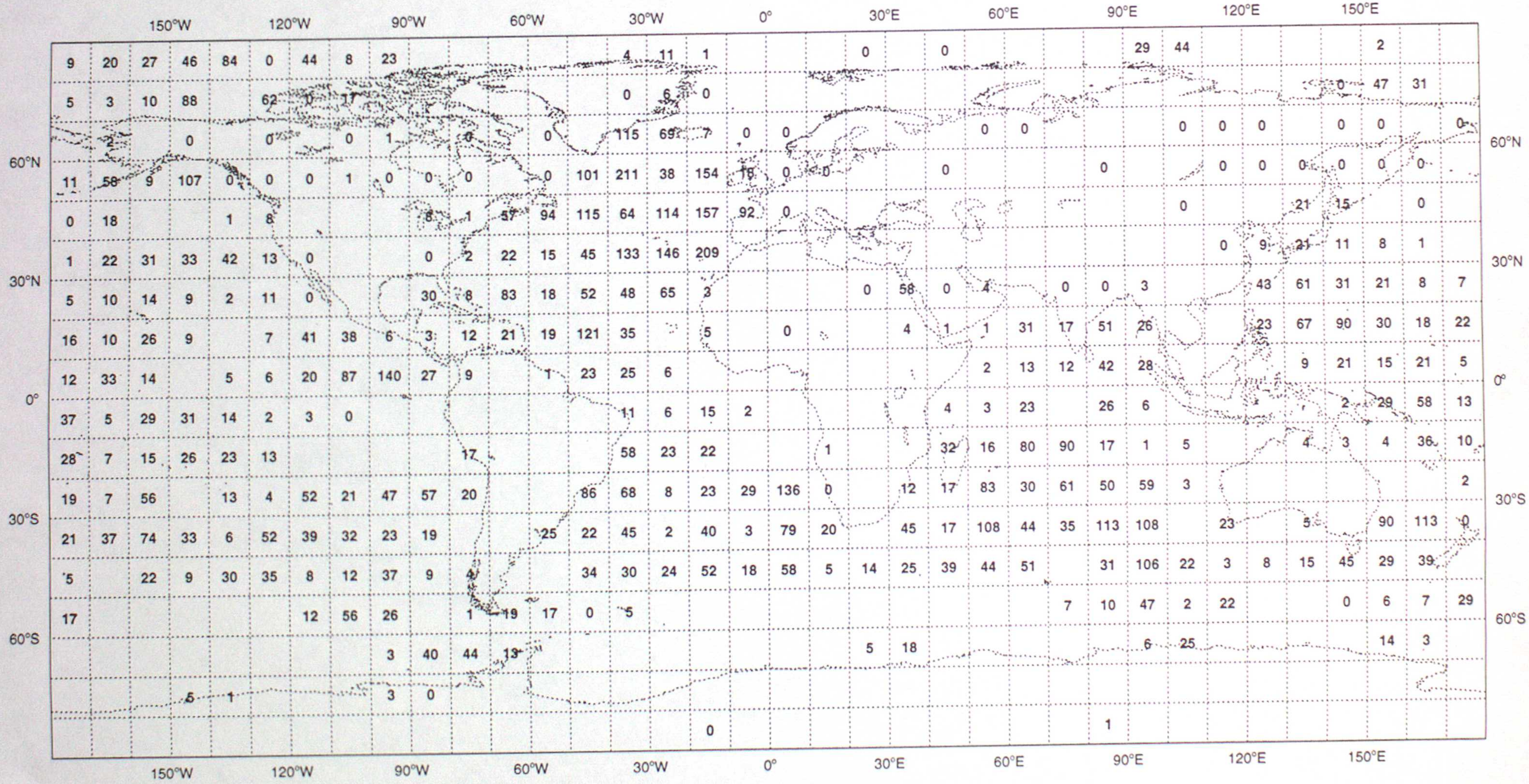

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
9 20 27 46 84 0 44 8 23 4 11 1 0 0 29 44 2
5 3 10 88 62 0 17 0 6 0 0 47 31
2 0 0 0 1 0 0 115 69 7 0 0 0 0 0 0 0 0 0 0
11 58 9 107 0 0 0 1 0 0 0 0 101 211 38 154 16 0 0 0 0 0 0 0 0 0 0
0 18 1 8 8 1 57 94 115 64 114 157 92 0 0 21 15 0
1 22 31 33 42 13 0 0 2 22 15 45 133 146 209 0 9 21 11 8 1
5 10 14 9 2 11 0 30 8 83 18 52 48 65 3 0 58 0 4 0 0 3 43 61 31 21 8 7
16 10 26 9 7 41 38 6 3 12 21 19 121 35 5 0 4 1 1 31 17 51 26 23 67 90 30 18 22
12 33 14 5 6 20 87 140 27 9 1 23 25 6 2 13 12 42 28 9 21 15 21 5
37 5 29 31 14 2 3 0 11 6 15 2 4 3 23 26 6 2 29 58 13
28 7 15 26 23 13 17 58 23 22 1 32 16 80 90 17 1 5 4 3 4 36 10
19 7 56 13 4 52 21 47 57 20 86 68 8 23 29 136 0 12 17 83 30 61 50 59 3 2
21 37 74 33 6 52 39 32 23 19 25 22 45 2 40 3 79 20 45 17 108 44 35 113 108 23 5 90 113 0
5 22 9 30 35 8 12 37 9 4 34 30 24 52 18 58 5 14 25 39 44 51 31 106 22 3 8 15 45 29 39
17 12 56 26 1 19 17 0 5 7 10 47 2 22 0 6 7 29
3 40 44 13 5 18 6 25 14 3
5 1 3 0
0 1
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 2B

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: July 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoys.
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 06, 12, 18 UTC
Element monitored		:Sea temperature (Degrees C).
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:10 degrees	
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:
	1.|bias|	≥ 3 degrees
	2.SD	≥ 5 degrees
	3.PGE	≥ 25.

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
SEA SURFACE TEMPERATURE											
15501	-10.1	-36.2	ALL	TS	SUR	94	0	0	0.1	-9.4	9.4
16526	-40.1	40.5	ALL	TS	SUR	703	0	0	0.8	-3.9	3.9
16527	-40.8	51.3	ALL	TS	SUR	692	0	0	3.3	-3.2	4.5
17635	-31.7	-14.2	ALL	TS	SUR	308	308	100			
21604	25.2	-79.7	ALL	TS	SUR	46	46	100			
21613	38.3	-77.1	ALL	TS	SUR	24	24	100			
22913	40.9	133.0	ALL	TS	SUR	345	0	0	1.1	5.2	5.3
23901	4.1	96.1	ALL	TS	SUR	152	0	0	3.7	-3.2	4.9
23904	9.3	80.8	ALL	TS	SUR	143	0	0	1.5	3.3	3.6
25540	81.2	104.7	ALL	TS	SUR	559	17	3	1.9	3.1	3.6
25541	82.0	102.1	ALL	TS	SUR	851	41	5	2.2	3.8	4.4
26511	82.3	97.6	ALL	TS	SUR	840	22	3	2.1	3.3	3.9
33502	-23.9	-15.7	ALL	TS	SUR	103	0	0	0.3	3.8	3.8
33560	-38.6	83.1	ALL	TS	SUR	570	569	100			
34913	-23.6	-110.6	ALL	TS	SUR	90	28	31	3.8	3.7	5.4
43508	12.9	-115.0	ALL	TS	SUR	245	245	100			
43912	15.8	-100.5	ALL	TS	SUR	260	260	100			
44507	40.7	-47.8	ALL	TS	SUR	184	0	0	1.6	3.4	3.8
44509	47.2	-54.0	ALL	TS	SUR	339	53	16	1.7	3.9	4.3
44532	61.4	-96.3	ALL	TS	SUR	26	22	85	2.6	0.6	2.7
46736	31.8	-163.0	ALL	TS	SUR	79	0	0	0.6	4.1	4.2
46969	43.3	-124.3	ALL	TS	SUR	188	76	40	2.6	5.7	6.3
46970	44.6	-124.0	ALL	TS	SUR	46	2	4	3.1	4.8	5.7
46972	32.1	-124.3	ALL	TS	SUR	227	0	0	0.3	3.2	3.2
51527	-3.5	153.2	ALL	TS	SUR	214	214	100			
51566	57.2	-108.1	ALL	TS	SUR	31	31	100			
51611	4.1	-90.2	ALL	TS	SUR	67	50	75	2.1	-3.4	4.0
52640	24.6	-83.2	ALL	TS	SUR	36	30	83	0.1	-7.2	7.2
52641	24.5	-83.1	ALL	TS	SUR	42	39	93	0.1	-7.6	7.6
52668	-3.7	152.4	ALL	TS	SUR	203	1	0	4.0	-3.3	5.1
53517	-12.4	70.4	ALL	TS	SUR	1043	0	0	1.0	7.0	7.1
54856	-44.8	-134.2	ALL	TS	SUR	353	0	0	0.9	4.2	4.3
55912	-37.7	164.9	ALL	TS	SUR	631	1	0	1.6	4.0	4.4
56808	24.9	-81.3	ALL	TS	SUR	22	0	0	3.4	-3.6	4.9
61589	41.4	134.1	ALL	TS	SUR	333	166	50	5.7	-0.4	5.7
62843	46.1	-17.4	ALL	TS	SUR	496	295	59	5.4	1.8	5.7
62844	43.9	-26.1	ALL	TS	SUR	385	283	74	7.9	2.0	8.2
71571	-69.4	-75.0	ALL	TS	SUR	224	224	100			

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: July 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60010	28.3N	16.5W	2367	S7	72	0	0	1	1.5	-5.2	5.4
60437	36.3N	2.8E	981	S8	85	0	0	52	0.9	-6.8	6.9
60476	35.4N	7.2E	1116	S8	85	6	7	52	0.8	13.5	13.5
62056	32.8N	21.8E	625	S8	102	0	0	4	2.0	-5.3	5.7
63170	9.5N	44.1E	1326	M	25	1	4	64	0.7	7.2	7.2
63175	9.5N	45.6E	1032	M	24	0	0	17	0.7	6.8	6.8
63333	11.1N	39.7E	1903	MS	21	2	10	0	0.5	4.8	4.8
63334	10.3N	37.7E	2515	MS	23	0	0	0	1.0	10.4	10.4
63402	7.7N	36.8E	1725	S	24	0	0	0	0.8	7.3	7.3
63450	9.0N	38.8E	2354	MS	22	0	0	0	0.7	4.5	4.6
63471	9.6N	41.9E	1260	MS	24	0	0	0	0.8	9.1	9.1
63478	5.9N	43.6E	295	MS	22	0	0	0	0.7	5.5	5.5
63602	3.1N	30.9E	1204	S	54	54	100	0			
63680	0.3N	32.6E	1144	S	31	0	0	0	1.0	-8.2	8.3
63801	4.9S	29.6E	882	S8	49	0	0	41	0.9	7.9	8.0
67250	15.6S	32.8E	882	S8	24	24	100	0			
68030	18.5S	25.6E	1071	8	59	0	0	0	1.0	5.0	5.1
68338	26.9S	24.6E	1234	S8	64	64	100	0			
68396	26.5S	31.3E	641	S8	56	0	0	2	1.3	5.2	5.4
68575	30.0S	30.0E	1175	S8	123	123	100	0			

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
30554	54.5N	113.6E	995	MS	124	1	1	0	4.6	4.9	6.7
30967	49.9N	115.8E	623	MS	92	3	3	1	1.3	-5.5	5.7
40726	36.8N	45.7E	1384	MS	103	1	1	1	0.8	4.8	4.9
40741	36.6N	61.2E	235	MS	106	2	2	1	0.9	-4.3	4.4
41254	23.1N	57.7E	1755	MS	82	82	100	0			
41396	16.0N	48.9E	700	S	56	1	2	0	1.1	6.2	6.3
41466	13.7N	44.1E	1402	8	53	1	2	0	1.0	-6.3	6.4
41515	35.6N	71.8E	1464	8	28	0	0	18	1.9	-5.0	5.3
44416	28.6N	81.6E	720	MS	80	3	4	3	1.6	4.4	4.7
47022	40.8N	128.2E	1200	S	95	0	0	1	1.2	4.6	4.8
51495	43.5N	91.6E	874	M	124	0	0	0	1.2	5.8	5.9
52602	38.8N	93.4E	2734	S	123	0	0	0	1.0	-5.9	6.0
52955	35.6N	100.8E	3201	S	124	0	0	0	0.9	12.9	12.9
54587	39.1N	123.2E	131	M	119	1	1	0	0.9	-4.0	4.1
56146	31.6N	100.0E	339	S	124	124	100	0			
56444	28.5N	98.9E	3488	S	124	60	48	35	0.8	13.4	13.4
56462	29.0N	101.5E	2994	S	124	0	0	0	1.4	8.8	8.9

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	43	0	0	0	1.1	-6.0	6.1
82181	2.0S	54.1W	146	MS	84	0	0	7	1.0	4.7	4.8
82704	7.6S	72.7W	170	MS	85	0	0	0	1.2	-4.0	4.2
83214	10.3S	54.9W	285	MS	83	0	0	2	1.6	-9.5	9.6
83235	12.4S	46.4W	604	MS	83	1	1	2	0.9	6.3	6.4
83332	14.1S	46.4W	826	MS	85	42	49	1	0.7	14.1	14.1
83376	15.9S	49.0W	740	MS	85	1	1	1	0.5	-4.3	4.3
83408	14.3S	43.8W	447	MS	79	0	0	1	1.3	11.0	11.1
83488	17.8S	42.9W	1097	MS	85	85	100	0			
83531	18.6S	46.5W	940	MS	85	0	0	1	0.8	-7.5	7.5
83579	19.6S	46.9W	1004	MS	84	0	0	0	0.7	-4.4	4.5
83587	19.9S	43.9W	850	MS	84	0	0	1	0.9	-7.8	7.9
83773	23.1S	48.9W	793	MS	83	1	1	1	0.8	-11.0	11.0
83836	25.5S	50.6W	837	MS	85	0	0	0	0.7	-5.3	5.3
83953	30.9S	55.5W	231	MS	86	0	0	0	1.3	-11.5	11.6

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
84377	3.8S	73.3W	125	MS	110	1	1	1	1.2	4.2	4.4
84401	5.2S	80.6W	49	MS	108	0	0	1	1.2	5.6	5.7
84425	5.9S	76.1W	179	MS	20	0	0	0	1.0	4.7	4.8
84455	6.5S	76.4W	281	MS	78	0	0	1	1.7	5.8	6.0
84472	7.1S	78.5W	2620	S	47	0	0	2	0.9	-5.8	5.9
84474	7.2S	76.7W	350	S	22	1	5	5	0.8	10.6	10.6
84501	8.1S	79.0W	26	MS	79	0	0	0	0.8	4.1	4.2
84688	13.7S	73.4W	3444	S	41	1	2	0	0.5	-12.5	12.5
84720	14.9S	75.0W	567	MS	51	0	0	0	1.0	5.0	5.1
84782	18.1S	70.3W	468	MS	84	0	0	1	1.5	8.4	8.5
85140	14.3S	67.4W	140	MS	59	0	0	2	1.7	4.7	5.0
85264	18.5S	64.1W	1998	S	61	61	100	0			
85312	19.8S	63.9W	992	S	48	1	2	0	1.2	5.8	5.9
85406	18.3S	70.3W	55	M	123	0	0	0	1.1	4.9	5.0
85432	22.5S	68.9W	2320	S8	80	0	0	0	0.9	4.6	4.7
85836	43.6S	71.8W	277	M	47	1	2	2	2.7	5.7	6.3

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
72327	36.1N	86.7W	182	MS	118	0	0	0	0.6	4.2	4.2
76118	30.4N	109.7W	1040	MS	28	0	0	0	0.9	-9.8	9.8
76243	28.7N	100.5W	250	MS	79	1	1	3	1.3	4.4	4.6
76743	18.0N	92.9W	10	MS	57	0	0	0	0.8	6.7	6.7
76903	14.9N	92.3W	118	MS	88	0	0	0	0.7	6.4	6.4

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
92010	6.1S	145.4E	1587	M	53	0	0	0	1.1	9.6	9.7
92036	2.4S	147.4E	1	8	241	241	100	0			
94130	14.8S	131.9E	120	MS	82	0	0	0	0.8	5.5	5.6
97378	10.7S	123.1E	1	MS	55	54	98	0	0.0	-14.5	14.5

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
04416	72.6N	38.4W	3202	S	114	1	1	0	0.7	-5.5	5.5
06685	47.0N	9.1E	515	MS	124	0	0	1	1.1	5.9	6.0
10557	50.5N	11.1E	845	S8	372	372	100	0			
12140	54.4N	18.7E	2	MS	118	0	0	1	0.8	7.8	7.8
13269	44.3N	19.9E	176	MS	122	0	0	0	0.8	7.6	7.6
14554	44.9N	18.4E	140	S	49	0	0	0	0.9	-13.0	13.0
14650	43.8N	18.0E	972	S	58	58	100	0			
16344	39.3N	16.4E	1710	S8	46	0	0	67	1.2	4.1	4.3
17042	41.4N	41.4E	33	M	61	0	0	0	1.0	4.0	4.1
17092	39.8N	39.5E	1218	S8	124	0	0	0	1.5	6.9	7.1
17203	38.9N	40.5E	1177	S8	124	0	0	1	1.2	6.4	6.5
17275	37.3N	40.7E	1050	S8	61	0	0	18	1.1	4.2	4.3

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	87	1	1	0	2.5	-6.4	6.9
89208	90.0S	0.0W	2835	M	32	8	25	0	1.5	-0.5	1.6
89263	66.0S	66.1W	20	M	220	0	0	16	2.5	6.1	6.6
89264	71.4S	68.9W	780	S	282	0	0	0	1.4	6.6	6.7
89272	74.8S	71.5W	1369	S	261	261	100	0			

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89612	66.3S	110.8E	390	S	268	268	100	5			
89627	77.2S	123.5E	3084	S	391	148	38	0	0.8	-14.0	14.0
89637	69.9S	130.0E	2560	S	315	287	91	0	0.8	14.2	14.2
89661	73.1S	169.6E	200	S	35	0	0	0	2.4	5.9	6.4
89666	76.7S	163.0E	200	S	32	32	100	0			
89744	74.0S	43.0E	3353	S	277	0	0	0	1.0	7.0	7.1
89769	78.5S	168.4E	50	S	399	397	99	0	0.1	-14.6	14.6
89847	67.6S	146.0E	30	S	328	4	1	0	2.0	-9.2	9.4

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: July 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	48	0	52	1.3	0.4	46	0	52	0	6.4	1.1
AAH	1916	1	40	1.0	0.3	1906	0	40	0	5.2	0.6
AAL	7242	0	20	1.4	0.2	7201	0	21	0	6.6	0.6
AAR	1943	1	7	1.5	-0.4	1911	0	7	0	6.8	0.6
ACA	4266	1	8	1.6	0.0	4201	0	8	0	6.8	0.5
ACI	130	0	44	1.5	-0.2	128	2	48	0	10.9	-0.5
AEA	956	1	3	1.7	0.5	937	0	3	0	7.2	0.6
AEL	597	1	9	2.2	-0.1	590	0	8	0	6.6	0.5
AFL	714	1	3	2.0	0.8	706	0	5	0	7.9	0.6
AFR	2000	0	7	1.6	0.2	1995	0	8	0	7.4	0.7
AIH	319	1	4	1.6	0.2	323	1	6	0	8.0	0.3
AJM	238	0	5	1.1	0.0	234	0	4	0	5.7	0.7
ALM	160	2	11	1.5	0.4	154	0	11	0	7.8	0.5
AMM	146	0	1	1.9	0.9	144	0	2	0	6.5	0.4
AMT	1593	1	42	1.6	0.7	1598	0	42	0	5.6	0.3
AMX	312	1	5	1.8	0.2	309	0	4	0	7.3	0.7
ANA	949	0	10	1.7	1.1	926	0	11	0	7.1	1.0
ANZ	6275	0	35	1.4	0.3	6240	0	35	0	6.9	1.1
AVA	432	1	5	1.8	0.6	428	0	5	0	8.3	0.9
AVE	282	2	6	1.9	0.9	275	0	13	0	10.8	2.2
AVN	145	1	51	1.1	0.2	145	0	51	0	8.3	0.8
AXF	29	0	24	1.9	-0.8	29	0	28	0	10.4	-0.1
AZA	833	1	10	2.8	0.8	835	0	5	0	7.1	0.8
BAF	37	0	0	1.3	-0.7	39	0	0	0	4.8	0.9
BAL	263	1	6	1.5	0.0	263	0	7	0	5.9	1.2
BAW	1127	0	6	1.9	0.4	1115	0	6	0	6.3	0.9
BBB	41	0	0	1.5	0.6	42	2	5	0	10.9	0.6
BLX	35	3	3	1.1	0.3	35	0	0	0	5.5	0.1
BWA	296	3	53	3.5	2.8	286	0	5	0	6.9	0.8
CAL	208	0	5	1.5	0.4	216	0	6	0	6.7	0.4
CCA	284	0	11	2.4	0.8	299	0	100	0	10.5	-0.8
CES	524	2	6	1.4	0.6	535	1	8	0	9.1	0.5
CFC	21	0	5	2.8	1.3	21	0	0	0	10.3	4.2
CFG	931	1	4	1.6	-0.5	913	0	4	0	6.4	0.7
CLX	519	2	7	1.8	0.1	528	0	6	0	6.9	0.6
CMI	234	1	1	1.9	1.0	226	0	2	0	8.6	2.2
CMM	798	0	8	1.5	0.1	788	0	8	0	6.1	0.7
COA	1638	1	33	1.3	0.1	1615	0	34	0	8.3	1.0
CPA	37	0	8	1.8	1.4	36	0	8	0	5.4	1.0
CRL	919	1	8	1.5	0.6	910	0	9	0	7.4	0.8
CSN	126	0	13	1.9	0.4	124	2	15	0	10.2	1.8
CTB	98	0	5	1.4	0.8	97	0	7	0	6.6	0.1
CTM	63	0	35	2.6	-1.3	62	0	32	0	8.5	0.7
CUB	249	3	6	2.4	1.6	251	0	3	0	7.2	1.1
DAL	3606	1	40	1.4	0.0	3607	0	39	0	5.7	0.2
DLH	1981	1	7	1.7	0.2	1950	0	7	0	6.7	0.8
EDW	34	0	3	1.2	-0.1	34	0	6	0	8.7	1.7
EEZ	62	2	44	1.6	0.8	60	0	7	0	5.2	1.1
EIA	120	1	44	1.8	-0.5	118	0	44	0	11.2	-0.5
ELY	126	2	5	1.5	0.2	132	1	8	0	9.0	-0.2
ETH	31	0	16	1.0	-0.3	31	0	19	0	11.9	0.1
EVA	677	1	6	1.4	-0.1	693	0	6	0	6.9	0.3
EWW	166	1	5	1.6	0.3	169	0	6	0	8.7	1.5
FDX	2335	1	39	1.6	0.6	2353	0	39	0	7.2	0.7
FIN	422	0	4	1.7	0.6	405	1	6	0	7.0	0.7
FJI	862	1	47	1.4	0.4	826	0	48	0	9.1	0.3
FOM	585	1	29	1.2	0.0	585	0	30	0	6.6	1.2
GAF	71	1	10	2.4	-0.6	74	0	8	0	9.4	1.2
GCO	134	0	10	1.9	0.7	138	1	100	0	15.5	3.4

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
GHA	141	2	4	1.8	-0.6	142	0	3	0	10.1	2.8
GIA	20	0	25	3.3	0.6	20	0	10	0	4.9	0.8
GRL	46	0	2	2.2	1.0	45	0	0	0	5.8	1.2
GTI	230	0	5	1.9	-0.2	228	0	5	0	7.6	0.4
HAL	4634	0	37	1.3	0.3	4578	0	37	0	7.6	1.2
HLN	58	2	2	1.0	0.3	58	0	3	0	10.3	1.3
HVN	58	2	3	2.3	1.0	58	0	0	0	5.5	0.1
IBE	3539	1	7	1.6	0.6	3444	0	7	0	7.1	0.6
ICE	1081	0	3	1.7	0.3	1044	0	4	0	6.8	0.9
ICL	28	0	4	1.7	0.5	26	0	8	0	9.2	-0.5
IWD	190	1	6	1.5	-0.4	192	0	4	0	6.3	1.3
JAA	122	0	5	1.9	1.4	118	0	4	0	6.5	2.1
JAL	5686	0	3	1.5	0.3	5620	0	4	0	7.0	0.6
JAZ	1286	1	4	1.8	1.3	1257	0	4	0	7.3	0.5
JKK	484	1	5	1.5	0.0	436	0	5	0	7.6	0.1
JMC	104	0	3	1.5	-0.6	105	0	2	0	6.9	-0.3
KAL	4209	1	7	1.5	0.1	4170	0	7	0	7.0	0.4
KLM	2358	0	6	1.5	0.3	2362	0	6	0	6.1	0.7
LAN	101	6	18	3.2	0.3	110	2	20	0	17.4	4.4
LAP	83	4	47	1.7	0.4	83	0	47	0	9.1	0.8
LDA	42	0	2	1.6	0.4	46	0	0	0	4.2	0.4
LDI	608	0	3	1.2	-0.4	600	0	3	0	6.9	0.4
LIB	1287	1	9	1.6	0.8	1293	0	10	0	6.7	1.0
LOT	100	0	2	1.7	-0.5	101	2	6	0	6.8	-0.3
LPR	23	0	0	1.9	-0.6	23	0	0	0	10.8	1.5
LTU	957	1	6	1.3	0.0	934	0	6	0	5.7	0.7
LXR	69	1	4	2.2	0.8	66	0	6	0	8.1	1.5
MAS	486	0	5	1.3	0.3	499	0	6	0	7.1	0.5
MAU	24	4	17	3.2	-0.3	24	0	17	0	13.2	3.5
MDA	22	0	0	1.4	1.0	21	0	0	0	5.0	0.2
MON	100	1	4	1.8	0.0	95	0	1	0	5.8	1.4
MPD	574	1	5	1.6	0.1	570	0	4	0	6.4	0.6
MPH	571	0	4	1.7	-0.8	567	0	5	0	6.2	0.4
NCA	862	0	3	1.7	0.2	851	0	4	0	7.3	0.5
NWA	11502	0	8	1.6	0.6	11431	0	8	0	7.6	0.3
NZL	3722	0	11	1.2	0.1	3722	0	11	0	4.8	0.7
OAE	627	1	40	1.2	0.1	631	0	41	0	6.8	0.6
PAC	457	1	32	1.5	-0.1	464	0	31	0	6.4	0.4
PAL	1507	1	7	1.4	0.2	1412	0	8	0	8.0	0.6
PAO	421	2	55	1.6	-0.1	412	1	56	0	11.4	0.5
PIC	78	3	3	0.8	0.2	77	0	0	0	7.7	-0.7
PUA	31	0	32	1.9	0.4	31	0	39	0	14.9	3.8
QFA	5100	0	60	1.4	0.4	5085	0	60	0	6.4	0.6
RAF	51	0	16	1.8	1.3	51	0	16	0	7.4	0.3
RAM	146	0	4	1.6	-0.6	146	0	3	0	6.4	0.0
RCH	243	2	97	3.0	-0.2	235	0	100	0	10.6	1.7
RKA	93	3	8	2.0	0.0	92	0	4	0	8.1	1.5
RRR	139	4	9	2.2	0.7	141	0	6	0	6.1	0.4
RYN	585	0	42	1.4	0.6	589	0	43	0	5.5	0.3
RZO	524	1	1	1.1	-0.3	520	0	2	0	6.4	0.5
SAA	497	1	4	1.7	0.2	493	0	4	0	6.6	1.1
SAS	59	2	8	1.8	0.2	59	0	5	0	5.2	1.1
SIA	444	0	2	1.5	0.5	465	0	3	0	6.5	0.4
SLR	99	0	4	1.0	0.5	102	0	7	0	7.6	0.7
SOL	24	0	0	1.0	0.5	24	0	0	0	7.3	1.5
SQC	59	0	2	1.8	1.1	59	0	2	0	5.0	0.0
SVA	65	0	11	1.7	0.5	68	0	10	0	9.1	-1.1
SWR	45	0	9	1.7	0.4	44	0	11	0	10.8	1.6
TAG	20	0	5	2.7	-0.2	20	0	5	0	4.0	1.3

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
TAM	55	5	31	3.4	0.7	55	2	55	0	11.0	0.5
TAP	1022	1	5	1.4	-0.1	1020	0	5	0	7.1	0.5
TBA	32	3	28	3.1	-0.5	32	3	28	0	13.1	1.3
THA	252	0	4	1.4	0.0	255	0	10	0	11.0	0.5
THT	98	0	98	2.4	0.7	93	0	29	0	8.8	1.4
THY	20	0	10	2.4	0.7	22	0	9	0	7.7	-1.9
TPA	32	0	0	1.0	0.4	33	0	3	0	6.7	0.6
TSC	237	1	3	1.3	0.1	232	0	4	0	6.9	1.5
TWA	1474	0	31	1.3	0.3	1460	0	31	0	6.2	0.6
UAL	166131	0	100	1.0	0.0	165959	0	100	0	4.8	0.4
UPS	1784	3	45	1.7	0.4	1782	0	43	0	7.7	0.8
USA	209	1	3	1.1	0.1	183	0	3	0	6.3	0.8
VIR	611	0	4	1.8	0.2	615	0	4	0	7.7	0.9
VPB	45	0	9	2.1	1.3	45	0	9	0	8.3	-1.2
VRG	317	4	29	2.6	0.4	316	1	100	0	11.7	1.2
VVR	51	0	39	2.2	1.3	56	0	36	0	5.4	1.1
WOA	139	1	5	1.5	0.6	154	0	6	0	7.4	0.4
YSS	268	0	8	1.7	1.1	271	0	10	0	6.4	1.4
AR	439	0	100	2.8	2.7	440	0	5	0	6.4	1.3
AU	64848	0	14	1.2	0.5	64853	0	14	0	5.3	0.7
EU	117881	0	32	1.3	0.3	117881	0	32	0	5.0	0.6
KL	6052	1	52	2.4	1.7	6018	0	54	0	6.4	1.2
LH	3048	0	6	1.8	1.3	3020	0	6	0	5.5	0.8
MK	5871	0	94	2.2	1.8	5826	0	8	0	7.1	1.0
SA	4661	0	46	2.0	1.0	4660	0	20	0	8.4	0.7
SV	2453	1	60	2.8	2.6	2436	0	4	0	6.2	0.5
WA	362	9	17	1.6	0.5	350	9	39	0	12.0	-0.9
XX	4339	1	9	1.3	0.5	4318	0	10	0	8.6	1.4
N	762	1	18	2.3	0.8	804	0	18	0	7.5	1.1
US ACARS	929062	1	55	1.2	0.5	929058	0	54	0	5.2	0.7

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: July 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :1000.0 – 300.1 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

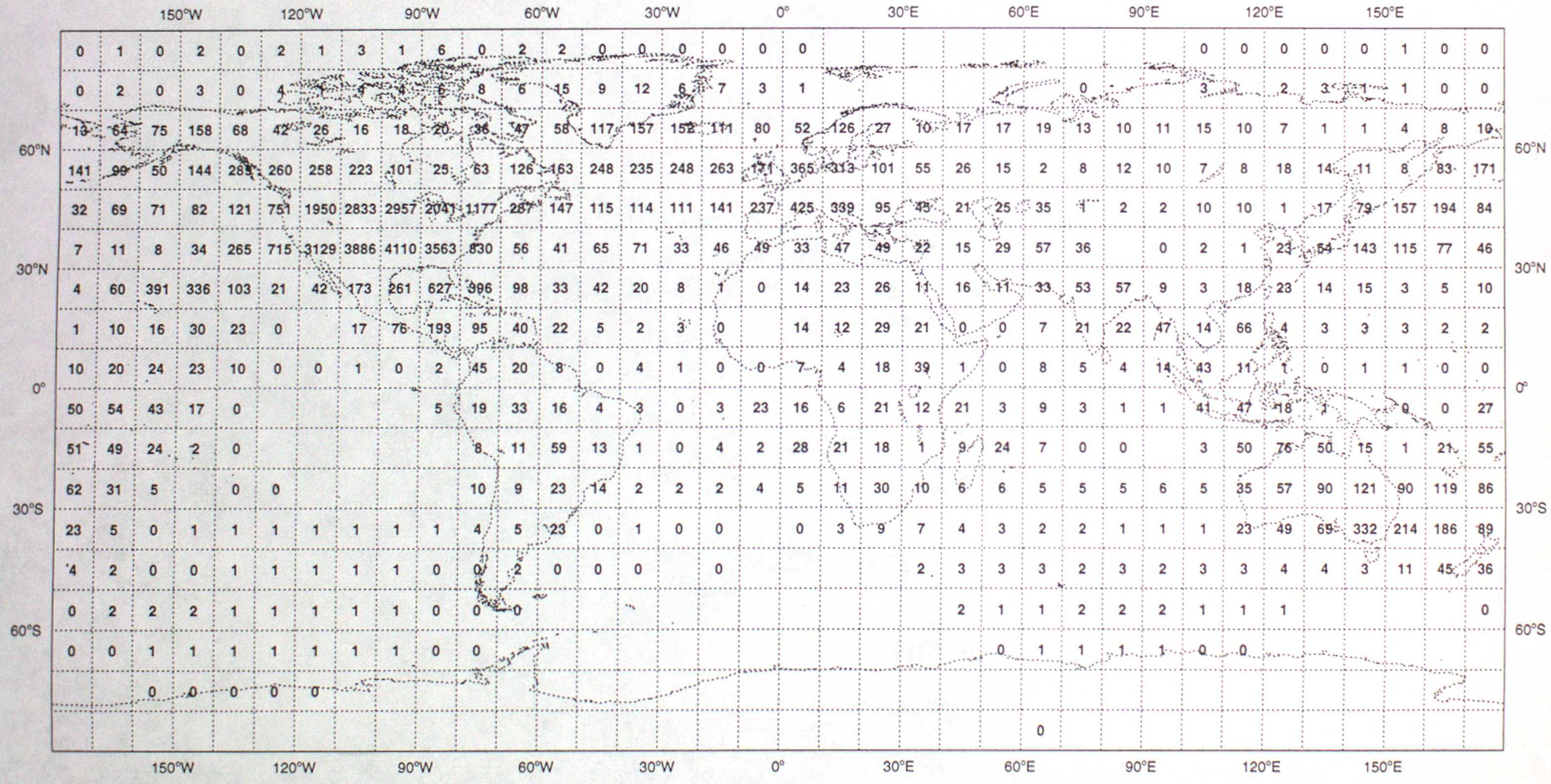
SELECTION CRITERIA :N REP ≥ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	27	4	15	0.4	0.1	24	0	13	0	8.4	2.3
AAL	263	1	18	1.0	0.1	261	0	18	0	6.8	0.6
AAR	30	0	27	1.0	-0.4	30	0	27	0	6.0	1.1
ACA	22	5	18	0.9	0.4	21	0	19	0	10.9	0.7
AEA	26	4	12	1.1	-0.4	26	0	8	0	4.4	0.2
AFR	79	1	5	1.4	0.3	77	1	4	0	5.9	0.7
AMT	23	0	30	2.3	1.9	23	0	30	0	3.7	0.1
ANZ	202	5	35	1.8	-0.2	200	0	34	0	11.6	1.5
AXF	44	0	34	1.2	0.1	44	0	36	0	13.5	2.5
CES	21	5	24	1.0	0.4	22	0	23	0	6.4	1.3
CFC	140	2	7	1.6	0.7	140	1	9	0	7.4	1.0
CFG	31	3	3	1.0	0.0	31	0	3	0	4.5	1.0
CMI	72	0	15	3.5	-1.5	72	0	6	0	8.9	2.3
COA	145	1	32	0.7	0.2	148	0	32	0	8.3	-0.6
CRL	37	0	0	1.2	0.8	39	0	5	0	11.4	1.6
CTM	37	0	27	2.6	-2.0	37	0	27	0	6.5	0.3
CUB	34	3	3	2.1	1.3	34	3	6	0	5.3	0.5
DAF	29	7	7	1.8	1.2	28	0	0	0	6.2	0.6
DAL	180	0	41	1.3	0.4	178	0	44	0	6.2	0.8
DHL	50	6	20	5.8	-5.7	49	0	8	0	14.1	2.6
DLH	81	0	30	1.9	0.6	81	0	28	0	6.9	1.8
EVA	52	0	38	2.3	-0.9	49	0	39	0	7.6	-0.6
EWW	50	0	2	1.5	0.9	50	0	12	0	14.1	3.6
FDX	298	2	27	1.6	1.0	308	0	26	0	8.2	0.5
FIN	36	0	3	2.2	0.5	32	0	3	0	5.4	-0.6
FOM	25	8	36	0.8	0.4	25	0	32	0	7.1	3.0
FXI	34	0	3	2.0	0.7	33	0	9	0	11.5	6.8
GAF	75	1	1	1.0	0.3	74	0	3	0	6.5	0.1
GCO	280	0	5	1.8	1.0	288	0	100	0	16.0	4.0
GHA	26	0	4	2.2	-0.4	26	0	4	0	10.6	0.3
HAL	185	1	42	1.4	-0.2	185	0	41	0	5.7	1.2
IBE	107	0	24	1.6	0.5	105	0	27	0	7.7	1.1
ICE	94	1	4	1.6	-0.2	95	0	4	0	6.3	0.7
JAL	56	0	7	1.7	0.2	56	0	11	0	9.1	-0.4
JAZ	106	3	4	1.9	1.2	106	0	0	0	5.8	-1.1
KAL	89	0	18	1.4	0.0	90	0	17	0	5.3	0.5
KIW	117	4	42	3.5	1.8	112	2	38	0	8.3	0.9
KLM	72	3	6	1.6	0.5	71	0	1	0	6.0	0.3
LAN	145	8	17	3.1	0.0	156	1	11	0	13.7	6.8
LIB	71	3	10	1.6	0.8	70	0	9	0	8.1	0.2
LTU	24	0	4	1.0	-0.5	23	0	4	0	8.2	-0.3
MAS	39	8	23	1.1	-0.4	36	0	19	0	4.5	0.0
NCA	92	0	1	1.7	0.2	91	1	3	0	7.1	-0.4
NWA	277	3	10	1.7	0.4	278	0	8	0	6.7	-0.3
NZL	19171	0	56	1.2	0.4	19170	0	56	0	4.2	0.4
PAL	58	0	7	1.2	-0.8	52	0	8	0	4.9	1.3
PIC	24	0	0	0.8	0.0	24	0	0	0	4.4	0.5
QFA	258	6	53	1.2	0.3	256	0	52	0	10.2	2.1
RCH	150	2	98	3.0	-0.5	152	0	99	0	12.7	2.4
RRR	158	2	15	4.0	3.0	162	0	12	0	9.6	0.5
SAA	44	5	9	1.8	-0.8	42	0	2	0	6.0	1.0
SIA	48	0	2	0.9	0.3	46	0	2	0	6.3	1.6
SWR	20	0	5	0.8	0.2	24	0	17	0	15.3	2.0
THA	20	0	5	1.1	0.7	20	0	30	0	18.3	1.8
UAL	283761	0	100	1.2	0.0	283395	0	100	0	4.0	0.4
UPS	83	0	30	1.2	0.3	86	0	30	0	5.5	1.3
VHJ	62	0	2	2.1	0.4	63	0	3	0	11.6	-0.4
VVP	26	23	58	4.7	1.7	33	0	21	0	13.2	9.3
AR	411	0	100	2.6	2.0	416	0	43	0	4.9	0.8

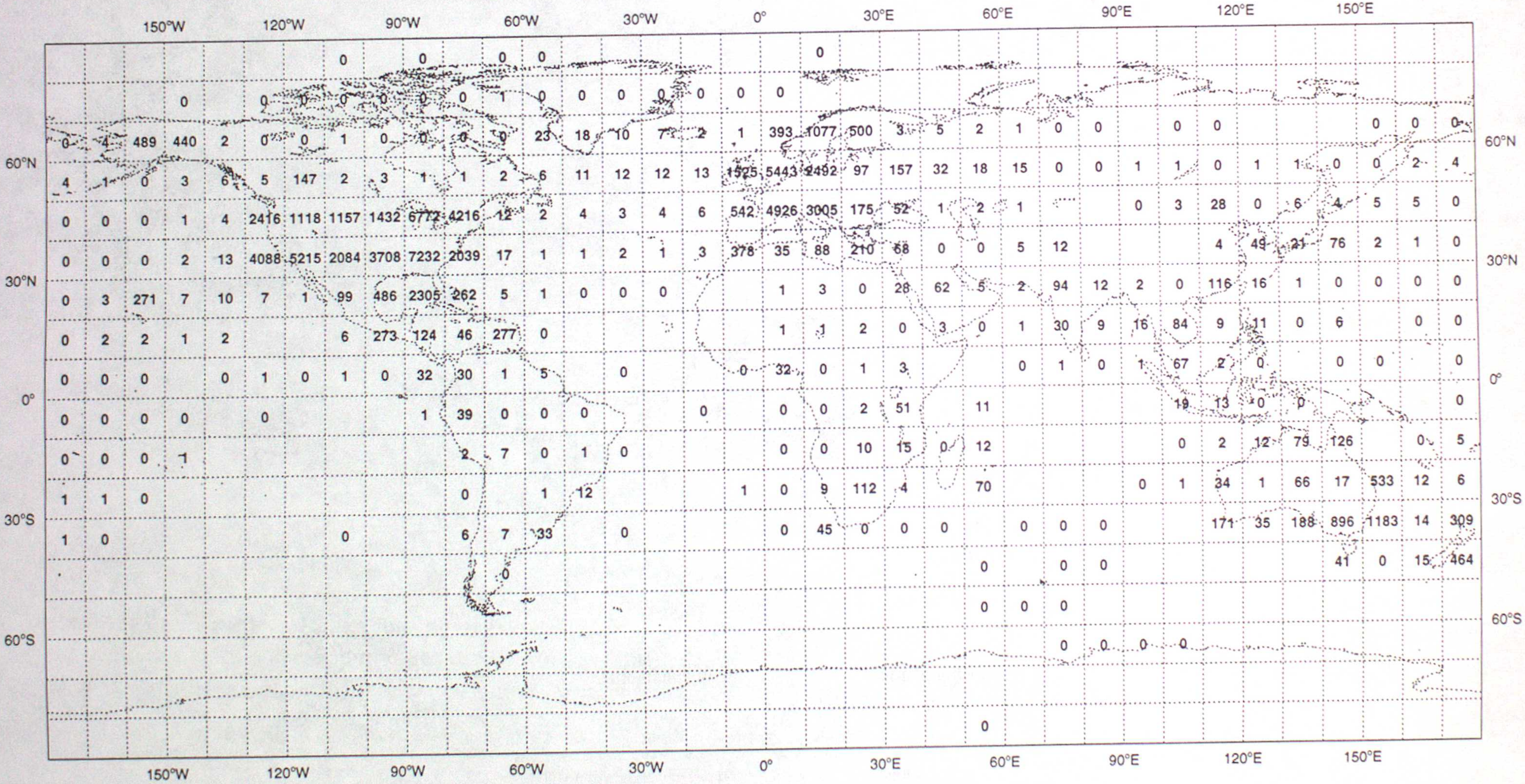
AU	109010	0	66	1.2	0.3	109009	0	66	0	4.1	0.4
EU	674218	0	74	1.1	0.3	673652	0	74	0	3.6	0.1
KL	5093	1	79	2.3	1.6	5067	1	78	0	4.4	0.4
LH	1331	0	63	1.6	0.4	1322	0	63	0	3.7	0.6
MK	4647	0	97	1.6	0.8	4610	0	54	0	4.6	0.3
SA	2502	0	66	1.7	0.5	2502	0	58	0	5.0	0.6
SV	4927	1	87	3.4	2.9	4894	0	51	0	5.6	1.6
WA	41	7	15	2.1	0.3	41	5	46	0	7.1	-2.7
XX	659	5	10	1.4	0.1	653	0	12	0	10.7	2.8
US ACARS	1181506	0	70	1.2	0.3	1179152	0	70	0	4.0	0.4

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. JULY 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 45800



0	1	0	2	0	2	1	3	1	6	0	2	2	0	0	0	0	0	0										0	0	0	0	0	1	0	0
0	2	0	3	0	4	1	4	4	6	8	6	15	9	12	6	7	3	1							0			3		2	3	1	1	0	0
13	64	75	158	68	42	26	16	18	20	36	47	58	117	157	152	111	80	52	126	27	10	17	17	19	13	10	11	15	10	7	1	1	4	8	10
141	99	50	144	285	260	258	223	101	25	63	126	163	248	235	248	263	171	365	313	101	55	26	15	2	8	12	10	7	8	18	14	11	8	83	171
32	69	71	82	121	751	1950	2833	2957	2041	1177	287	147	115	114	111	141	237	425	339	95	45	21	25	35	1	2	2	10	10	1	17	79	157	194	84
7	11	8	34	265	715	3129	3886	4110	3563	830	56	41	65	71	33	46	49	33	47	49	22	15	29	57	36		0	2	1	23	54	143	115	77	46
4	60	391	336	103	21	42	173	261	627	396	98	33	42	20	8	1	0	14	23	26	11	16	11	33	53	57	9	3	18	23	14	15	3	5	10
1	10	16	30	23	0		17	76	193	95	40	22	5	2	3	0		14	12	29	21	0	0	7	21	22	47	14	66	4	3	3	3	2	2
10	20	24	23	10	0	0	1	0	2	45	20	8	0	4	1	0	0	7	4	18	39	1	0	8	5	4	14	43	11	1	0	1	1	0	0
50	54	43	17	0					5	19	33	16	4	3	0	3	23	16	6	21	12	21	3	9	3	1	1	41	47	18	1		0	0	27
51	49	24	2	0						8	11	59	13	1	0	4	2	28	21	18	1	9	24	7	0	0		3	50	76	50	15	1	21	55
62	31	5		0	0					10	9	23	14	2	2	2	4	5	11	30	10	6	6	5	5	5	6	5	35	57	90	121	90	119	86
23	5	0	1	1	1	1	1	1	1	4	5	23	0	1	0	0		0	3	9	7	4	3	2	2	1	1	1	23	49	65	332	214	186	89
4	2	0	0	1	1	1	1	1	0	0	2	0	0	0		0					2	3	3	3	2	3	2	3	3	4	4	3	11	45	36
0	2	2	2	1	1	1	1	1	0	0	0											2	1	1	2	2	2	1	1	1					0
0	0	1	1	1	1	1	1	1	0	0													0	1	1	1	1	0	0						
		0	0	0	0	0																													
																								0											

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. JULY 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 73833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30°W
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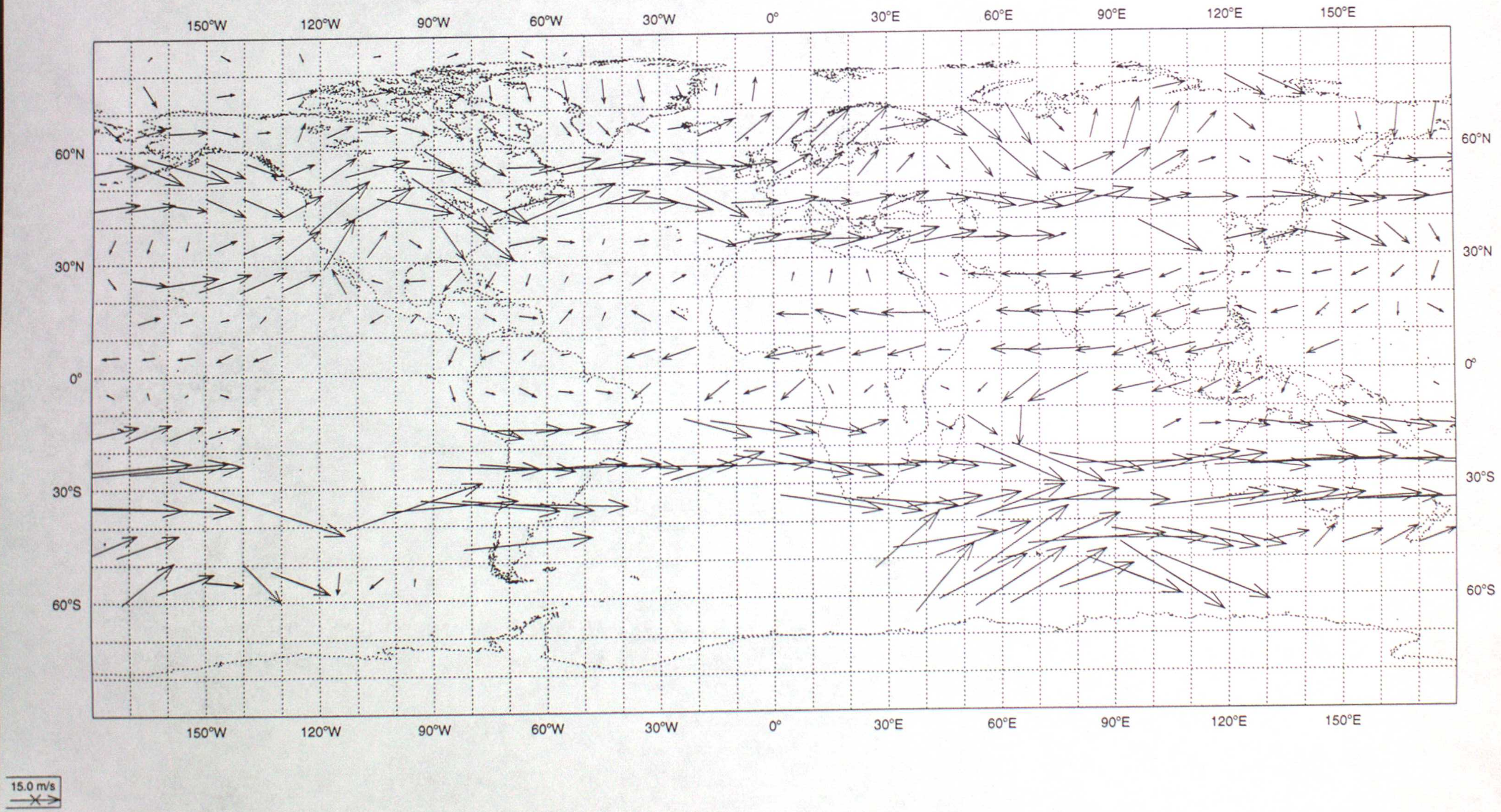
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 0 0 0 0
0 0 0 0 0 1 0 0 0 0 0 0 0 0
0 4 489 440 2 0 0 1 0 0 0 0 23 18 10 7 2 1 393 1077 500 3 5 2 1 0 0 0 0 0 0 0
4 1 0 3 6 5 147 2 3 1 1 2 6 11 12 12 13 1525 5443 2492 97 157 32 18 15 0 0 1 1 0 1 1 0 0 2 4
0 0 0 1 4 2416 1118 1157 1432 6772 4216 12 2 4 3 4 6 542 4926 3005 175 52 1 2 1 0 3 28 0 6 4 5 5 0
0 0 0 2 13 4088 5215 2084 3708 7232 2039 17 1 1 2 1 3 378 35 88 210 68 0 0 5 12 4 49 21 76 2 1 0
0 3 271 7 10 7 1 99 486 2305 262 5 1 0 0 0 1 3 0 28 62 5 2 94 12 2 0 116 16 1 0 0 0 0
0 2 2 1 2 6 273 124 46 277 0 1 1 2 0 3 0 1 30 9 16 84 9 11 0 6 0 0
0 0 0 0 1 0 1 0 32 30 1 5 0 0 32 0 1 3 0 1 0 1 67 2 0 0 0 0
0 0 0 0 0 1 39 0 0 0 0 0 0 2 51 11 19 13 0 0 0
0 0 0 1 2 7 0 1 0 0 0 10 15 0 12 0 2 12 79 126 0 5
1 1 0 0 1 12 1 0 9 112 4 70 0 1 34 1 66 17 533 12 6
1 0 0 6 7 33 0 0 45 0 0 0 0 0 0 171 35 188 896 1183 14 309
0 0 0 0 41 0 15 464
0 0 0
0 0 0 0
0

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. JULY 2001

Observations with O-B vector difference greater than 60 ms-1 excluded

Arrows are plotted where greater than 30 obs are present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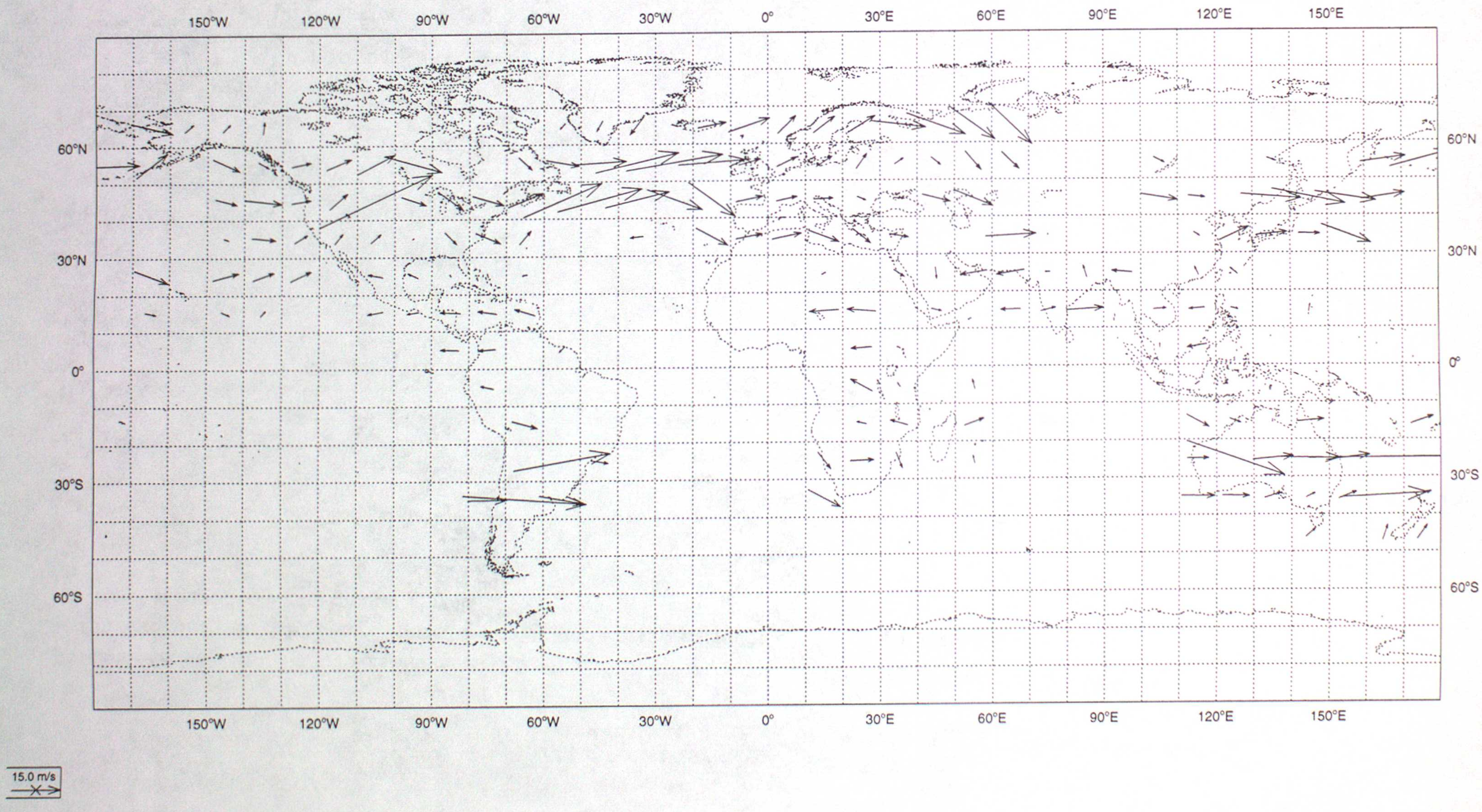
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. JULY 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present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60°W
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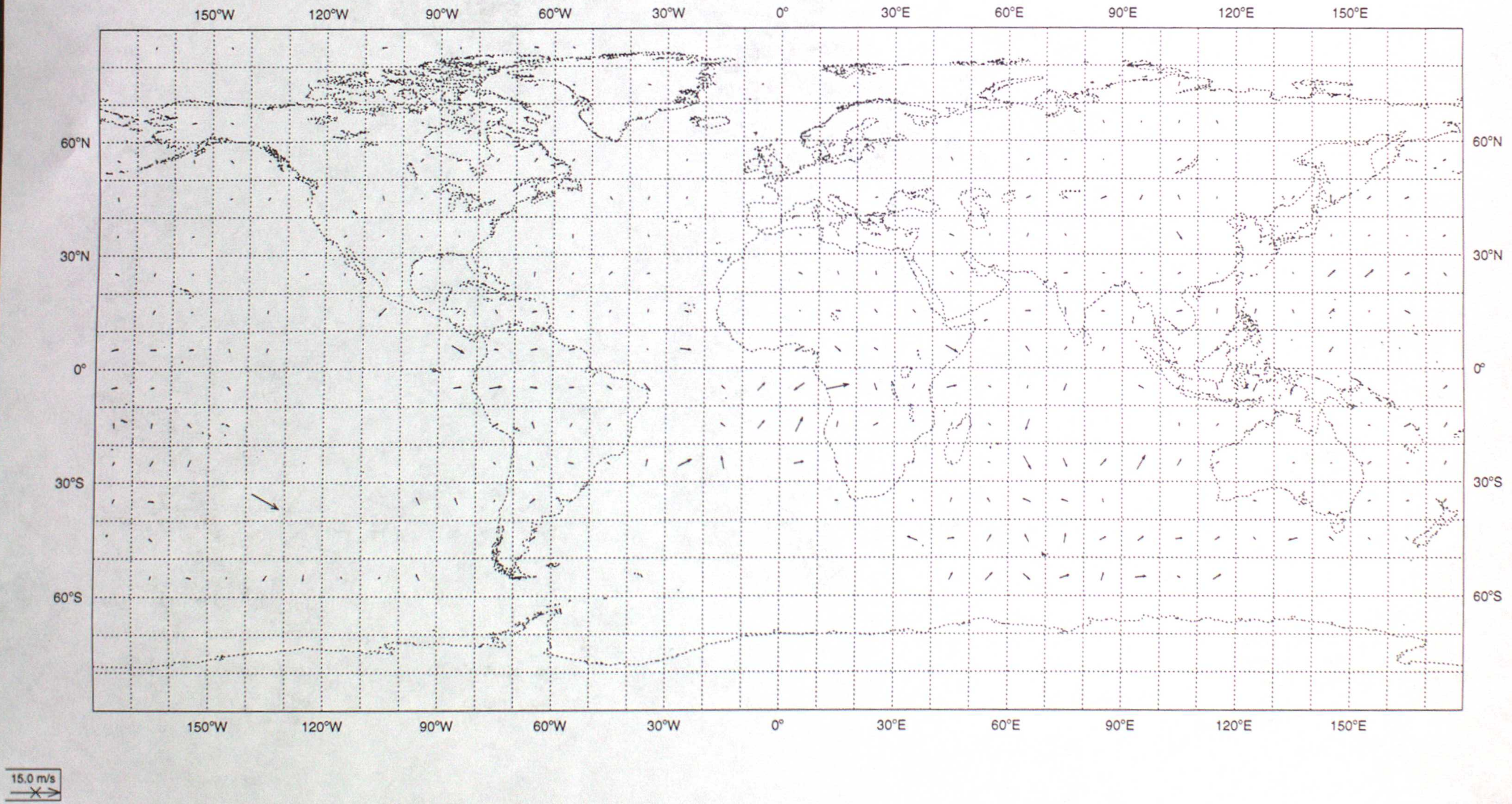
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. JULY 2001

Observations with O-B vector difference greater than 60 ms-1 excluded

Arrows are plotted where greater than 30 obs are present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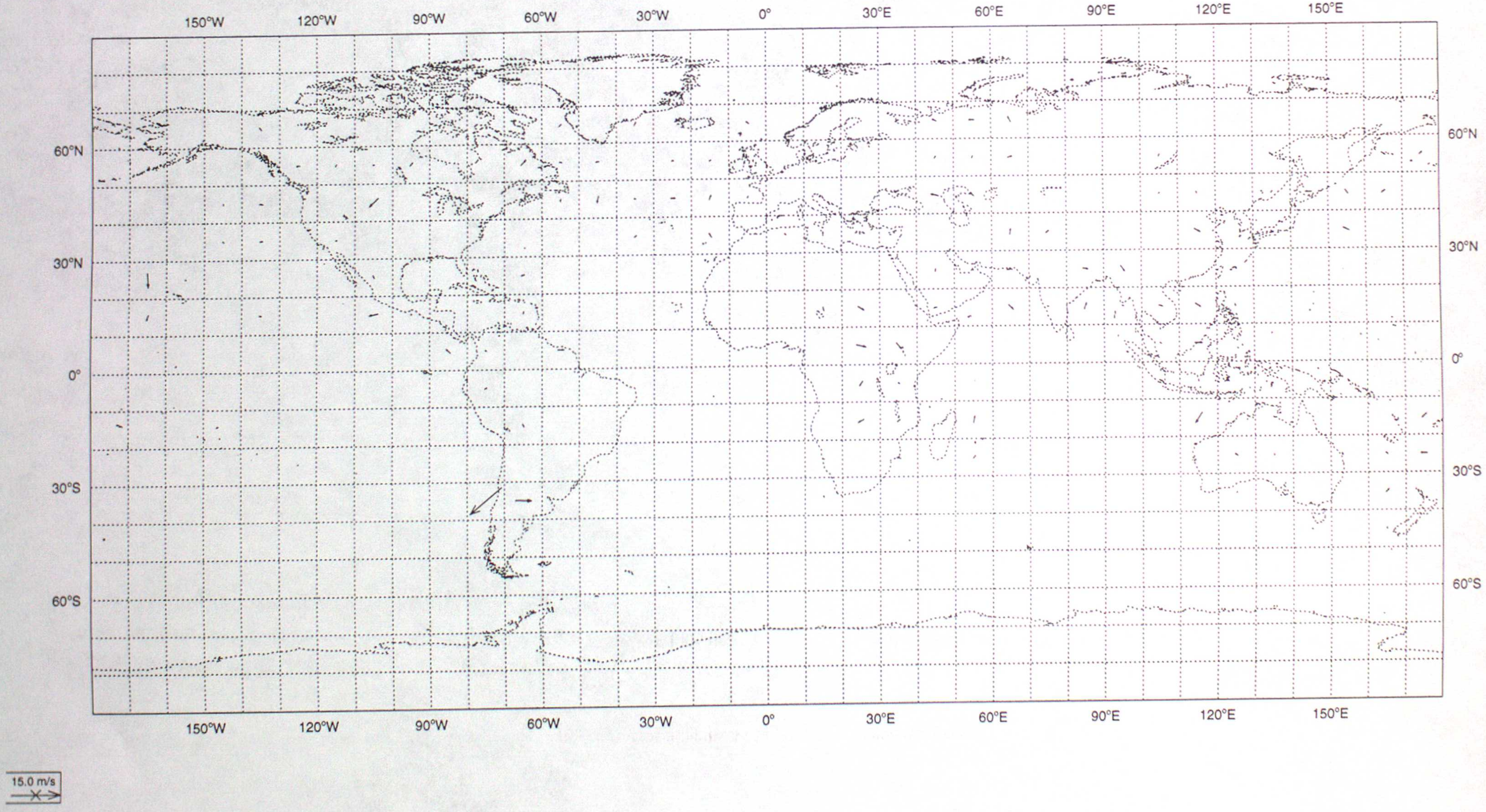
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. JULY 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present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120°W
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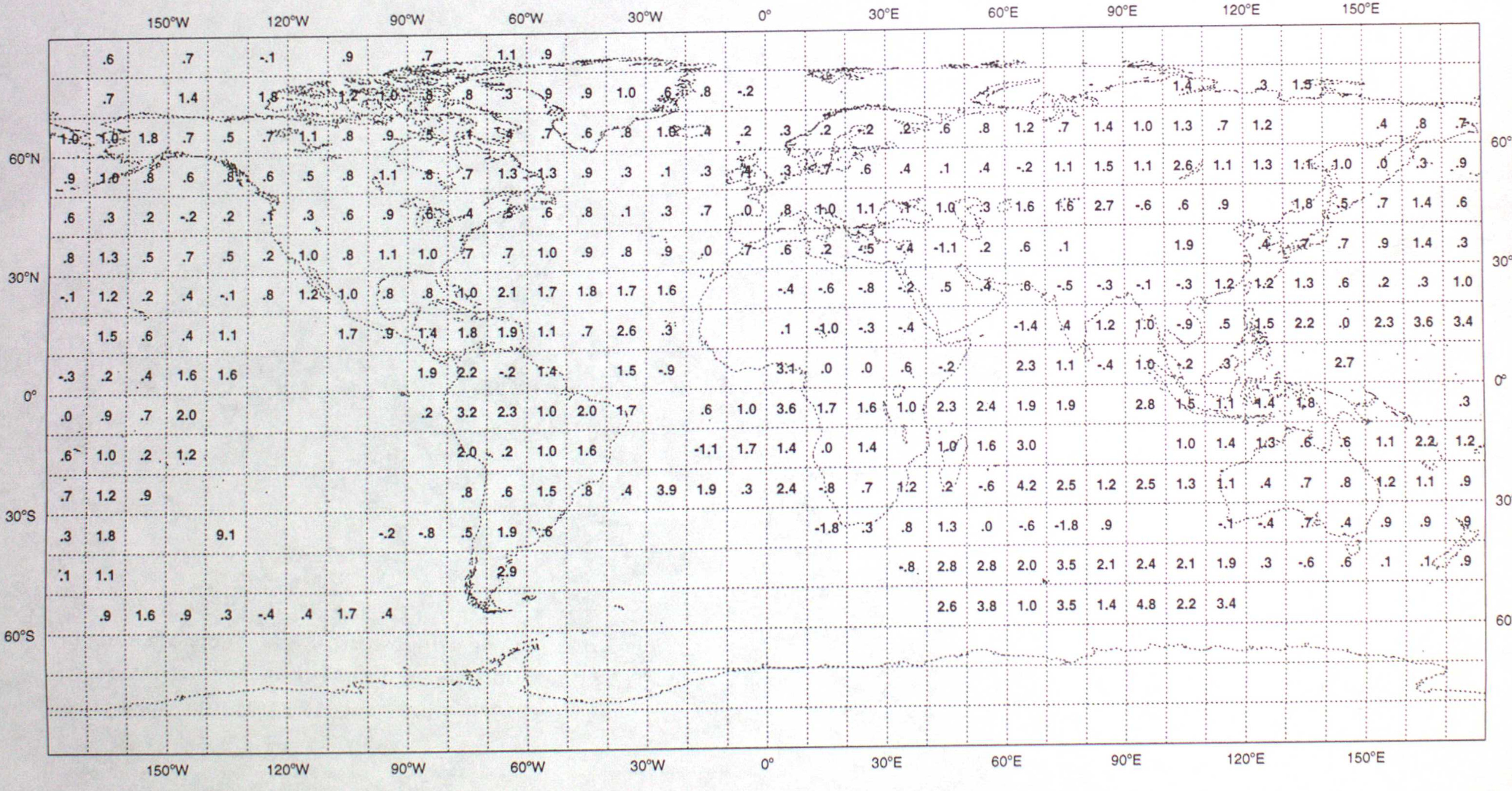
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). JULY 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present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30°E
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90°E
120°E
150°E
60°N
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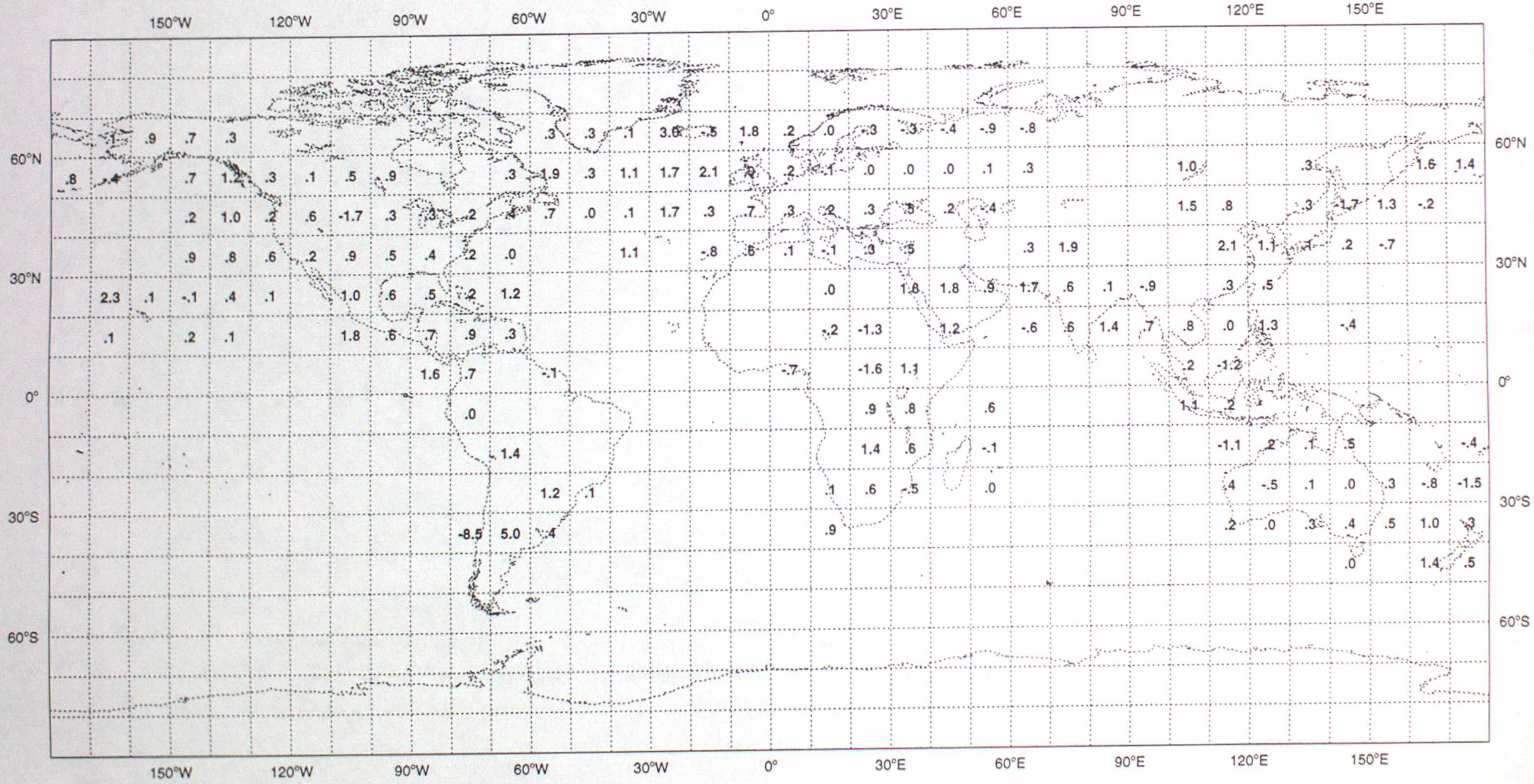
0°
30°S
60°S
.6 .7 -.1 .9 .7 1.1 .9
.7 1.4 1.8 1.2 1.0 .8 .8 .3 .9 .9 1.0 .6 .8 -.2 1.4 .3 1.5
1.0 1.0 1.8 .7 .5 .7 1.1 .8 .9 .5 .1 .4 .7 .6 .8 1.6 .4 .2 .3 .2 .2 .2 .6 .8 1.2 .7 1.4 1.0 1.3 .7 1.2 .4 .8 .7
.9 1.0 .8 .6 .8 .6 .5 .8 1.1 .8 .7 1.3 1.3 .9 .3 .1 .3 .4 .3 .7 .6 .4 .1 .4 -.2 1.1 1.5 1.1 2.6 1.1 1.3 1.1 1.0 .0 .3 .9
.6 .3 .2 -.2 .2 .1 .3 .6 .9 .6 .4 .5 .6 .8 .1 .3 .7 .0 .8 1.0 1.1 .1 1.0 .3 1.6 1.6 2.7 -.6 .6 .9 1.8 .5 .7 1.4 .6
.8 1.3 .5 .7 .5 .2 1.0 .8 1.1 1.0 .7 .7 1.0 .9 .8 .9 .0 .7 .6 .2 .5 .4 -1.1 .2 .6 .1 1.9 .4 .7 .7 .9 1.4 .3
-.1 1.2 .2 .4 -.1 .8 1.2 1.0 .8 .8 1.0 2.1 1.7 1.8 1.7 1.6 -.4 -.6 -.8 .2 .5 .4 .6 -.5 -.3 -.1 -.3 1.2 1.2 1.3 .6 .2 .3 1.0
1.5 .6 .4 1.1 1.7 .9 1.4 1.8 1.9 1.1 .7 2.6 .3 .1 -1.0 -.3 -.4 -1.4 .4 1.2 1.0 -.9 .5 1.5 2.2 .0 2.3 3.6 3.4
-.3 .2 .4 1.6 1.6 1.9 2.2 -.2 1.4 1.5 -.9 3.1 .0 .0 .6 -.2 2.3 1.1 -.4 1.0 -.2 .3 2.7
.0 .9 .7 2.0 .2 3.2 2.3 1.0 2.0 1.7 .6 1.0 3.6 1.7 1.6 1.0 2.3 2.4 1.9 1.9 2.8 1.5 1.1 1.4 1.8 .3
.6 1.0 .2 1.2 2.0 .2 1.0 1.6 -1.1 1.7 1.4 .0 1.4 1.0 1.6 3.0 1.0 1.4 1.3 .6 .6 1.1 2.2 1.2
.7 1.2 .9 .8 .6 1.5 .8 .4 3.9 1.9 .3 2.4 -.8 .7 1.2 .2 -.6 4.2 2.5 1.2 2.5 1.3 1.1 .4 .7 .8 1.2 1.1 .9
.3 1.8 9.1 -.2 -.8 .5 1.9 .6 -1.8 .3 .8 1.3 .0 -.6 -1.8 .9 -.1 -.4 .7 .4 .9 .9 .9
.1 1.1 2.9 -.8 2.8 2.8 2.0 3.5 2.1 2.4 2.1 1.9 .3 -.6 .6 .1 .1 .9
.9 1.6 .9 .3 -.4 .4 1.7 .4 2.6 3.8 1.0 3.5 1.4 4.8 2.2 3.4

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). JULY 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present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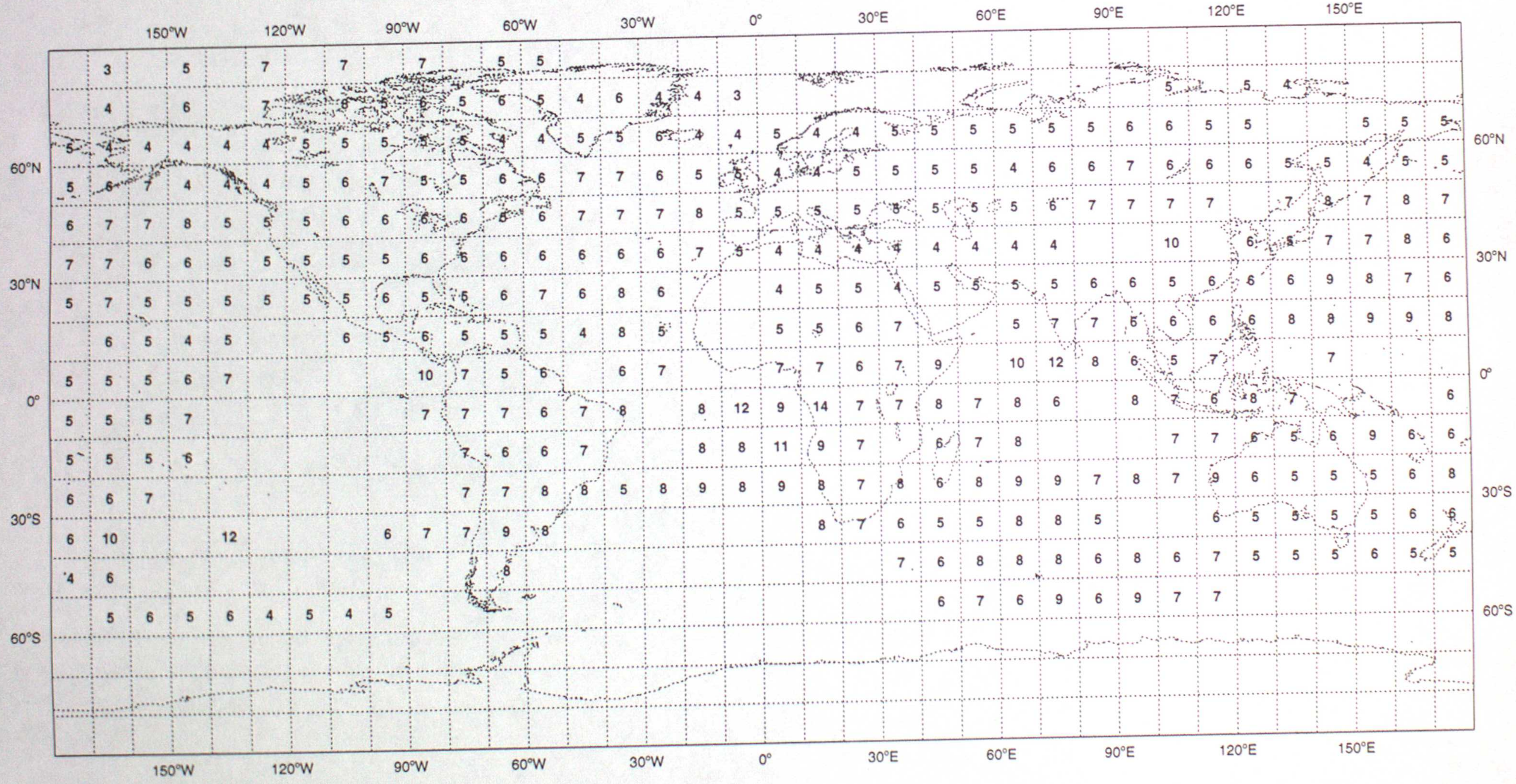
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-.1 .9 .7 .3 .3 .3 .1 3.6 -.5 1.8 .2 .0 .3 .3 -.4 -.9 -.8
.8 .4 .7 1.2 .3 .1 .5 .9 .3 1.9 .3 1.1 1.7 2.1 .2 .2 -.1 .0 .0 .0 .1 .3 1.0 .3 1.6 1.4
.2 1.0 .2 .6 -1.7 .3 .3 .2 .4 .7 .0 .1 1.7 .3 .7 .3 .2 .3 .5 .2 .4 1.5 .8 .3 1.7 1.3 -.2
.9 .8 .6 .2 .9 .5 .4 .2 .0 1.1 -.8 .6 .1 -.1 .3 .5 .3 1.9 2.1 1.1 .1 .2 -.7
2.3 .1 -.1 .4 .1 1.0 .6 .5 .2 1.2 .0 1.8 1.8 .9 1.7 .6 .1 -.9 .3 .5
.1 .2 .1 1.8 .6 .7 .9 .3 -.2 -1.3 1.2 -.6 .6 1.4 .7 .8 .0 1.3 -.4
1.6 .7 -.1 -.7 -1.6 1.1 .2 -1.2
.0 .9 .8 .6 1.1 .2
1.4 1.4 .6 -.1 -1.1 .2 .1 .5 -.4
1.2 .1 .1 .6 -.5 .0 .4 -.5 .1 .0 .3 -.8 -1.5
-8.5 5.0 .4 .9 .2 .0 .3 .4 .5 1.0 .3
.0 1.4 .5

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). JULY 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present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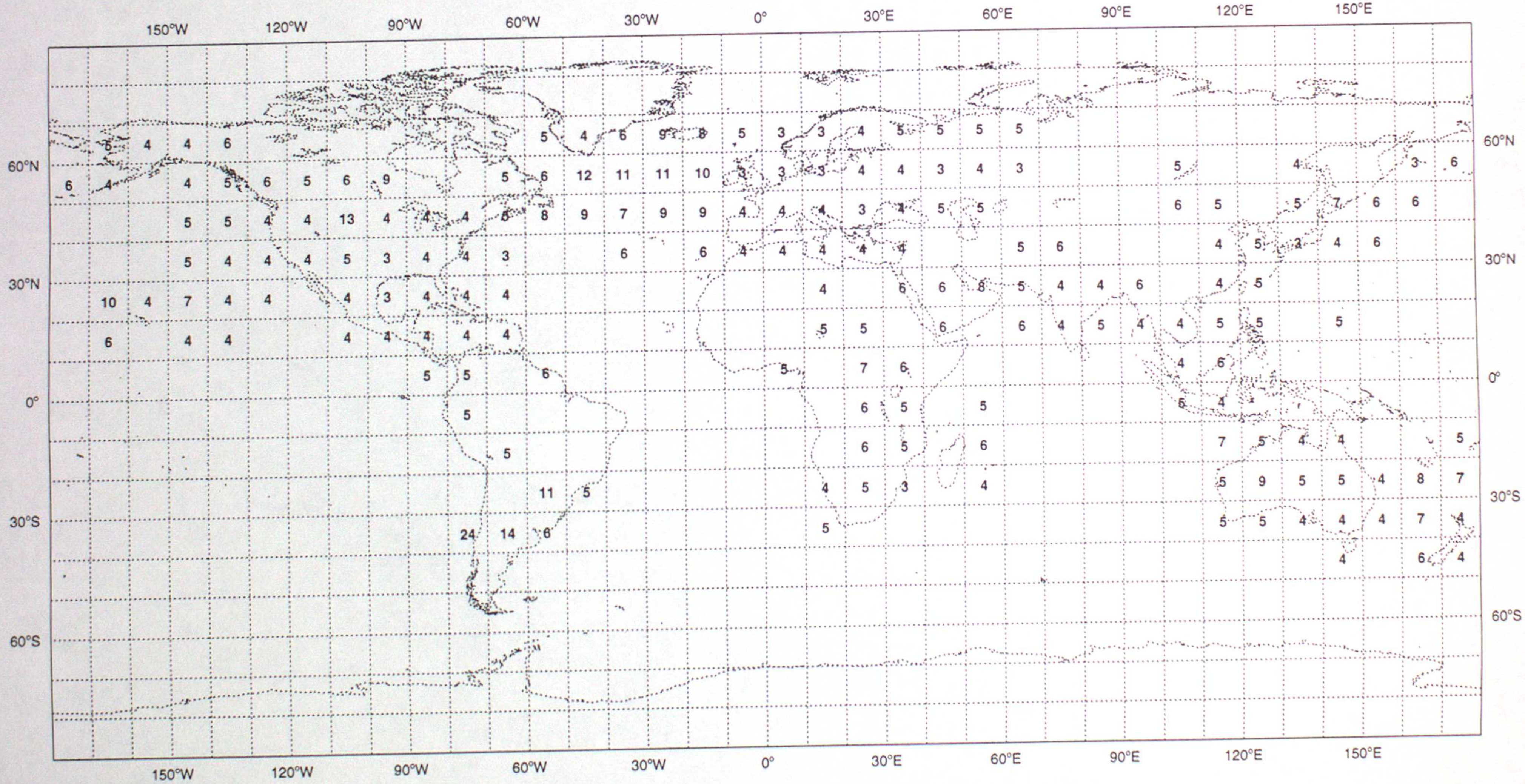
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). JULY 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present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60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
6 4 4 6 5 4 6 9 8 5 3 3 4 5 5 5 5
6 4 4 5 6 5 6 9 5 6 12 11 11 10 3 3 3 4 4 3 4 3 5 4 3 6
5 5 4 4 13 4 4 4 6 8 9 7 9 9 4 4 4 3 4 5 5 6 5 5 7 6 6
5 4 4 4 5 3 4 4 3 6 6 4 4 4 4 4 5 6 4 5 3 4 6
10 4 7 4 4 4 3 4 4 4 4 6 6 8 5 4 4 6 4 5
6 4 4 4 4 4 4 4 5 5 6 6 4 5 4 4 5 5 5
5 5 6 5 7 6 4 6
5 6 5 5 6 4
5 6 5 6 7 5 4 4 5
11 5 4 5 3 4 5 9 5 5 4 8 7
24 14 6 5 5 5 4 4 4 7 4
4 6 4

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: July 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 30.0 hPa

Element monitored :GEOPOTENTIAL HEIGHT IN metres

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown duringperiod.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.1

SELECTION CRITERIA : ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.

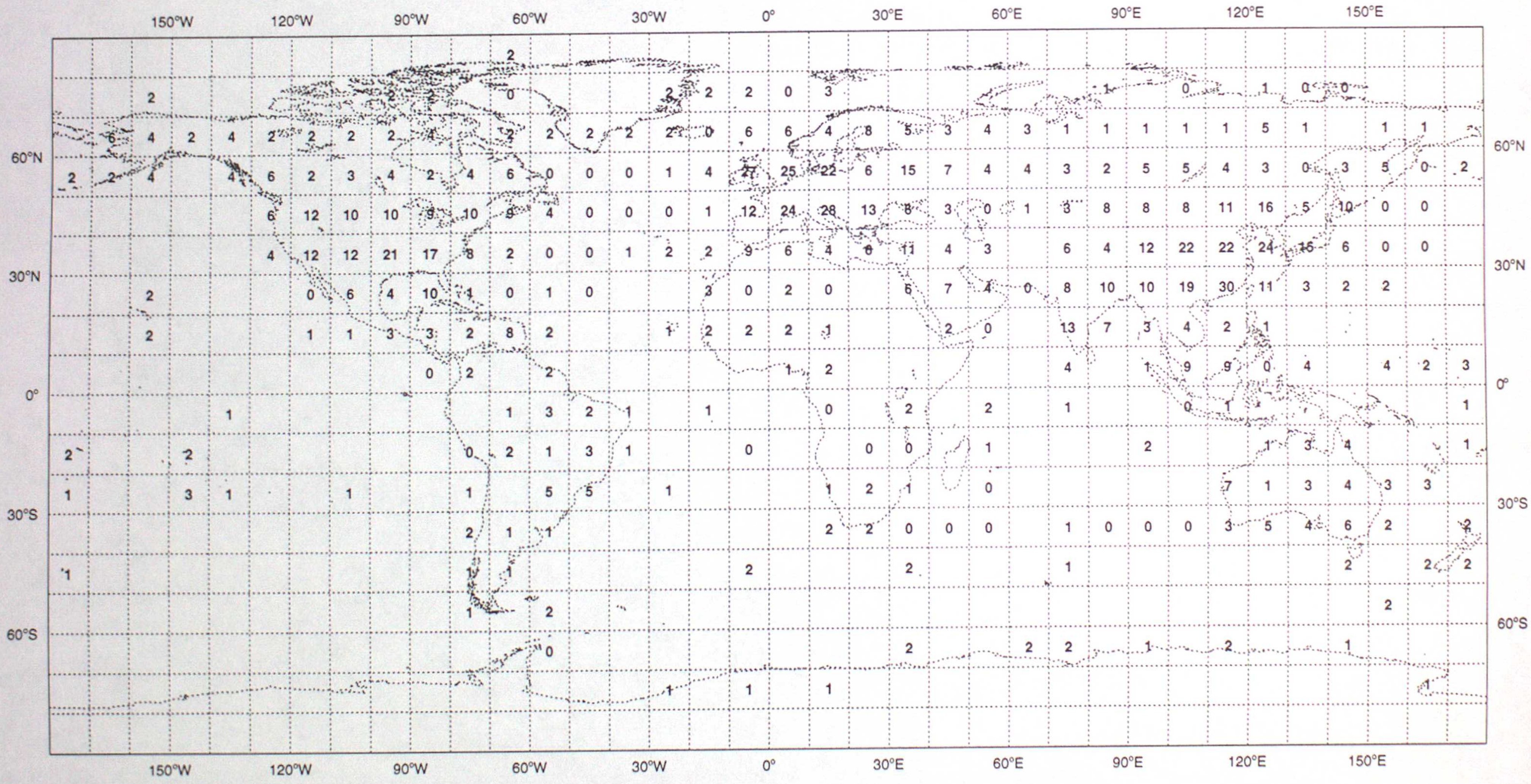
ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
23418	00	Z	30	65/ 57	24	0	88.6	236.0	252.0	4
23933	00	Z	50	61/ 69	10	0	61.0	275.1	281.8	7
26477	12	Z	50	56/ 31	16	2	67.3	261.9	270.4	6
28722	12	Z	50	55/ 56	20	0	61.0	185.1	194.9	5
32098	00	Z	100	49/ 143	20	1	42.2	188.2	192.9	4
33345	12	Z	200	50/ 31	27	0	20.0	-78.0	80.5	4
33791	12	Z	200	48/ 33	22	0	69.7	-90.4	114.1	9
33837	00	Z	50	46/ 31	25	1	71.4	223.2	234.3	6
34247	12	Z	50	50/ 41	28	0	38.2	166.2	170.5	4
34731	12	Z	400	47/ 40	10	1	19.2	-53.5	56.9	6
42027	00	Z	100	34/ 75	13	1	117.1	-84.9	144.7	6
42101	00	Z	200	30/ 76	12	0	105.9	-53.8	118.7	9
42314	00	Z	100	27/ 95	13	0	152.4	28.3	155.0	7
42361	12	Z	150	26/ 78	10	0	118.2	-11.5	118.7	6
42369	00	Z	30	27/ 81	9	1	88.5	185.1	205.2	6
42369	12	Z	50	27/ 81	12	1	97.8	175.2	200.6	6
42379	00	Z	150	27/ 83	22	2	58.1	-100.1	115.7	7
42379	12	Z	150	27/ 83	14	1	44.1	-107.1	115.8	5
42397	12	Z	100	27/ 88	14	1	139.2	-60.7	151.9	7
42410	00	Z	50	26/ 92	13	0	79.3	178.6	195.4	5
42492	00	Z	70	26/ 85	10	0	132.8	79.1	154.6	5
42647	00	Z	150	23/ 73	16	0	115.2	-21.9	117.3	4
42647	12	Z	150	23/ 73	14	0	96.4	55.4	111.2	6
42667	00	Z	50	23/ 77	13	0	155.3	57.0	165.4	6
42667	12	Z	100	23/ 77	14	1	125.8	53.0	136.5	5
42701	00	Z	50	23/ 85	16	0	96.5	103.9	141.8	4
42701	12	Z	100	23/ 85	18	0	134.8	-31.0	138.3	4
42724	00	Z	30	24/ 91	14	0	106.2	205.5	231.3	4
42809	00	Z	30	23/ 88	12	1	149.6	153.5	214.3	6
42971	00	Z	50	20/ 86	8	1	113.3	173.9	207.5	6
42971	12	Z	50	20/ 86	12	0	112.9	132.7	174.2	4
43003	00	Z	150	19/ 73	19	1	126.5	-60.9	140.4	4
43003	12	Z	70	19/ 73	8	2	72.5	164.6	179.9	8
43014	12	Z	200	20/ 75	15	0	103.1	43.3	111.8	5
43041	00	Z	150	19/ 82	16	0	105.7	-64.8	123.9	4
43128	00	Z	150	17/ 78	28	0	65.8	-135.2	150.3	6
43192	00	Z	200	15/ 74	13	0	60.8	-134.3	147.4	5
43279	00	Z	200	13/ 80	25	0	62.2	-108.8	125.3	8
43279	12	Z	70	13/ 80	16	0	129.6	-67.1	145.9	7
43295	00	Z	150	13/ 78	29	0	80.8	-50.4	95.2	4
43333	00	Z	150	12/ 93	26	0	72.4	-111.4	132.9	6
43333	12	Z	200	12/ 93	22	0	69.7	-72.9	100.8	5
43371	00	Z	150	8/ 77	28	1	76.0	-88.0	116.3	5
47185	00	Z	30	33/ 126	24	0	72.0	268.6	278.1	4
53463	00	Z	1000	41/ 112	30	0	22.9	27.0	35.4	5
58424	00	Z	70	31/ 117	30	0	30.8	148.7	151.8	4
58424	12	Z	50	31/ 117	20	0	44.6	184.9	190.3	5
82193	12	Z	50	-1/ -48	2	0	17.5	183.5	184.3	4
84628	12	Z	850	-12/ -77	11	0	8.5	-78.6	79.1	7
91366	00	Z	50	9/ 168	27	1	76.9	250.0	261.5	7

Figure 8. TEMP 500 hPa geopotential mean daily count. JULY 2001

All hours

Global average number of observations in 24 hours = 1149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2
2 0 2 2 2 0 3 1 0 1 0 0
6 4 2 4 2 2 2 2 4 2 2 2 2 0 6 6 4 8 5 3 4 3 1 1 1 1 1 5 1 1 1
2 2 4 4 6 2 3 4 2 4 6 0 0 0 1 4 27 25 22 6 15 7 4 4 3 2 5 5 4 3 0 3 5 0 2
6 12 10 10 9 10 9 4 0 0 0 1 12 24 28 13 8 3 0 1 3 8 8 8 11 16 5 10 0 0
4 12 12 21 17 8 2 0 0 1 2 2 9 6 4 6 11 4 3 6 4 12 22 22 24 16 6 0 0
2 0 6 4 10 1 0 1 0 3 0 2 0 6 7 4 0 8 10 10 19 30 11 3 2 2
2 1 1 3 3 2 8 2 1 2 2 2 1 2 0 13 7 3 4 2 1
0 2 2 1 2 4 1 9 9 0 4 4 2 3
1 1 3 2 1 1 0 2 2 1 0 1 1
2 2 0 2 1 3 1 0 0 0 1 2 1 3 4 1
1 3 1 1 1 5 5 1 1 2 1 0 7 1 3 4 3 3
2 1 1 2 2 0 0 0 1 0 0 0 3 5 4 6 2 2
1 1 1 2 2 1 2 2 2
1 2 2
0 2 2 2 1 2 1
1 1 1 1

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: July 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

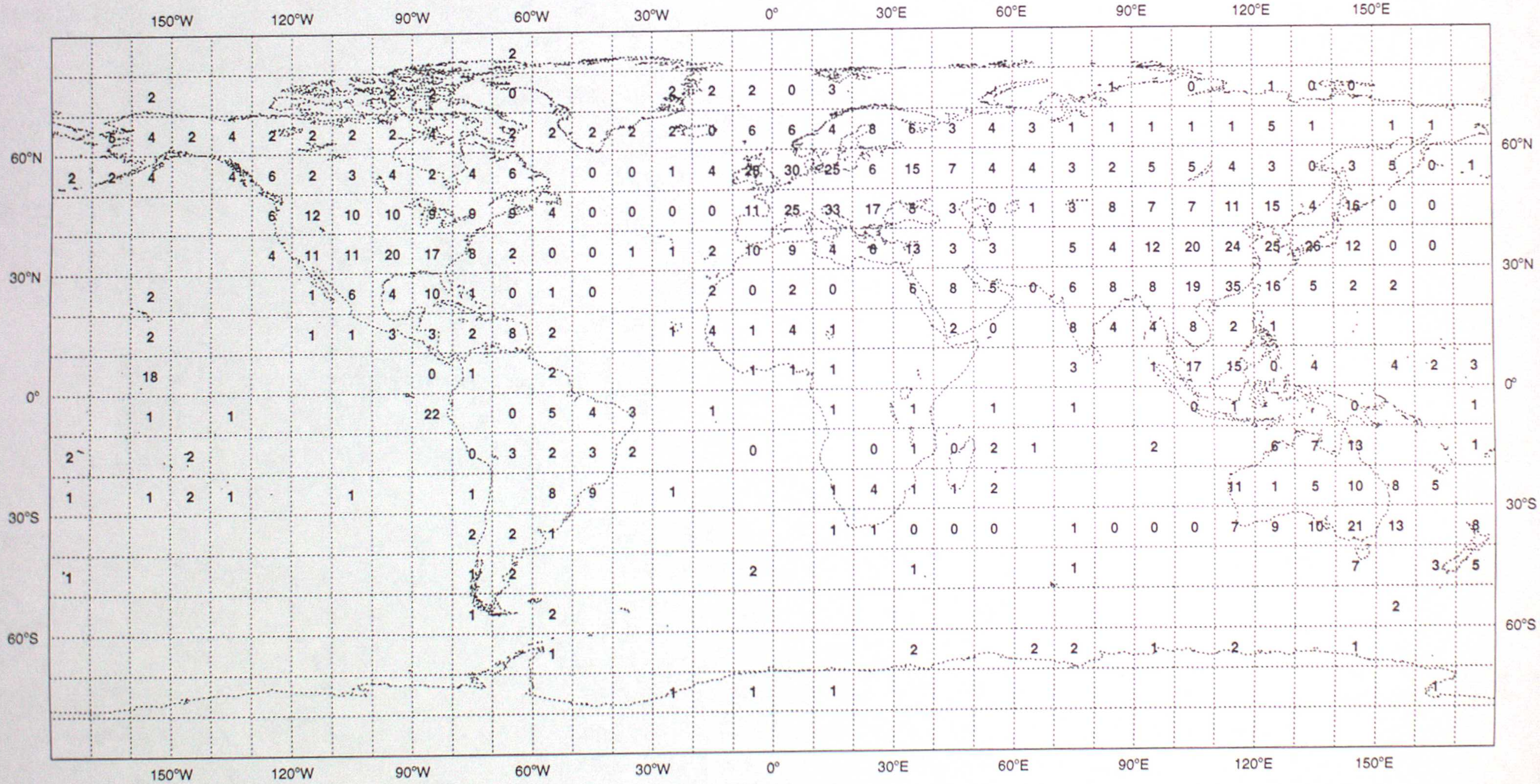
GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
PSPIU	00	V	150	-5/ -81	30	0	100	-1.3	4.8	24.4	3
PSPIU	12	V	150	-5/ -81	29	0	100	-4.1	1.7	28.2	3
17240	12	V	250	38/ 31	28	0	100	-5.0	1.7	21.1	1
17351	00	V	200	37/ 35	30	0	100	-7.4	-1.0	15.3	1
42101	12	V	300	30/ 76	11	0	9	5.5	-1.6	16.8	1
43346	00	V	100	11/ 80	26	0	3	12.6	1.1	17.4	1
43346	12	V	100	11/ 80	21	0	4	10.2	4.5	15.4	1
43371	00	V	100	8/ 77	29	0	13	14.9	3.6	18.5	1
43371	12	V	100	8/ 77	25	1	16	12.6	3.1	17.2	1
47102	12	V	250	38/ 125	27	0	11	-3.3	4.5	17.1	1
48455	12	V	100	14/ 101	20	0	10	10.7	8.5	15.7	1
48914	00	V	150	9/ 105	10	0	100	-1.5	16.0	18.4	1
61902	12	V	150	-8/ -14	16	0	50	16.4	9.6	22.2	1
63741	00	V	150	-1/ 37	23	0	73	-1.9	-0.1	16.8	1
63985	00	V	150	-5/ 56	14	0	57	-12.1	-7.8	18.3	1
63985	12	V	150	-5/ 56	18	0	50	-12.9	-5.9	20.4	1
64400	12	V	150	-5/ 12	13	0	0	13.5	4.2	18.1	1
64458	12	V	150	2/ 16	14	2	100	12.9	2.9	17.2	1
68174	12	V	200	-24/ 29	19	0	42	-6.5	-3.5	21.1	5
68263	12	V	300	-26/ 28	13	0	46	-17.9	1.2	24.4	2
68424	12	V	250	-28/ 21	11	0	0	-11.5	-0.9	16.9	1
68442	12	V	200	-29/ 26	14	0	71	-12.0	-2.7	26.1	4
68461	12	V	250	-28/ 28	16	1	68	-13.5	-3.7	22.5	4
68512	12	V	250	-30/ 18	18	0	100	-15.3	1.2	19.7	4
68842	12	V	300	-34/ 26	12	0	66	-14.9	1.7	20.3	1
80001	12	V	300	13/ -82	21	0	76	-1.1	-4.9	18.8	1
83362	00	V	200	-16/ -56	10	0	10	-2.7	4.6	15.0	1
91843	00	V	150	-21/-160	20	0	5	1.4	-4.1	16.9	1
94791	00	V	200	-30/ 153	31	0	3	3.1	2.7	20.5	1

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. JULY 2001
All hours
Global average number of observations in 24 hours = 1358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30°S
60°S
2
2 0 2 2 2 0 3 1 0 1 0 0
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2 2 4 4 6 2 3 4 2 4 6 0 0 1 4 26 30 25 6 15 7 4 4 3 2 5 5 4 3 0 3 5 0 1
6 12 10 10 9 9 9 4 0 0 0 0 11 25 33 17 8 3 0 1 3 8 7 7 11 15 4 16 0 0
4 11 11 20 17 8 2 0 0 1 1 2 10 9 4 6 13 3 3 5 4 12 20 24 25 26 12 0 0
2 1 6 4 10 1 0 1 0 2 0 2 0 6 8 5 0 6 8 8 19 35 16 5 2 2
2 1 1 3 3 2 8 2 1 4 1 4 1 2 0 8 4 4 8 2 1
18 0 1 2 1 1 1 3 1 17 15 0 4 4 2 3
1 1 22 0 5 4 3 1 1 1 1 1 0 1 0 1
2 2 0 3 2 3 2 0 0 1 0 2 1 2 6 7 13 1
1 1 2 1 1 1 8 9 1 1 4 1 1 2 11 1 5 10 8 5
2 2 1 1 1 0 0 0 1 0 0 0 7 9 10 21 13 8
1 1 2 2 1 1 7 3 5
1 2 2
1 2 2 2 1 2 1
1 1 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: July 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
29612	12	DD	55/ 78	20	21.5	4.2	12.6
33791	12	DD	48/ 33	13	15.9	7.5	21.6
47102	12	DD	38/ 125	26	-12.2	8.7	24.1
48914	00	DD	9/ 105	10	25.5	5.9	20.5
57749	00	DD	28/ 110	20	14.3	3.5	18.0
57749	12	DD	28/ 110	19	13.2	8.6	23.2
60360	12	DD	37/ 8	18	19.4	3.0	14.8
60490	12	DD	36/ -1	23	-11.7	7.5	15.9
62337	12	DD	31/ 34	24	-17.6	2.1	11.4
78866	00	DD	18/ -63	8	-14.3	4.9	19.7
89664	00	DD	-78/ 167	13	10.3	6.3	20.0

MONITORING OF SATELLITE WINDS

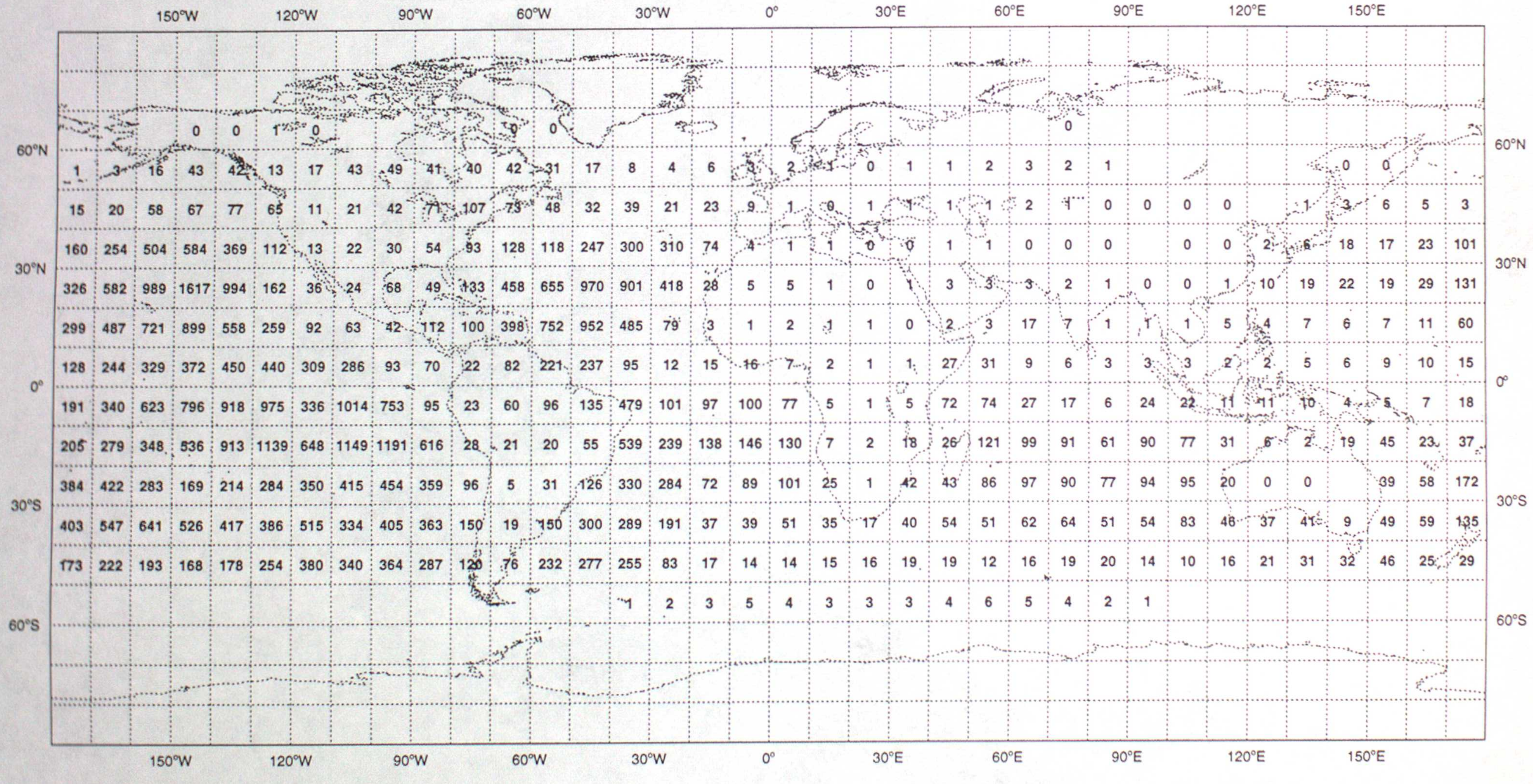
MONITORING CENTRE: BRACKNELL

MONTH: July 2001

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa :Mean wind :Mean observation minus background vector wind differences :Mean observation minus background speed differences :RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. JULY 2001
Global average number of observations in 24 hours = 56204



			0	0	1	0					0	0													0										
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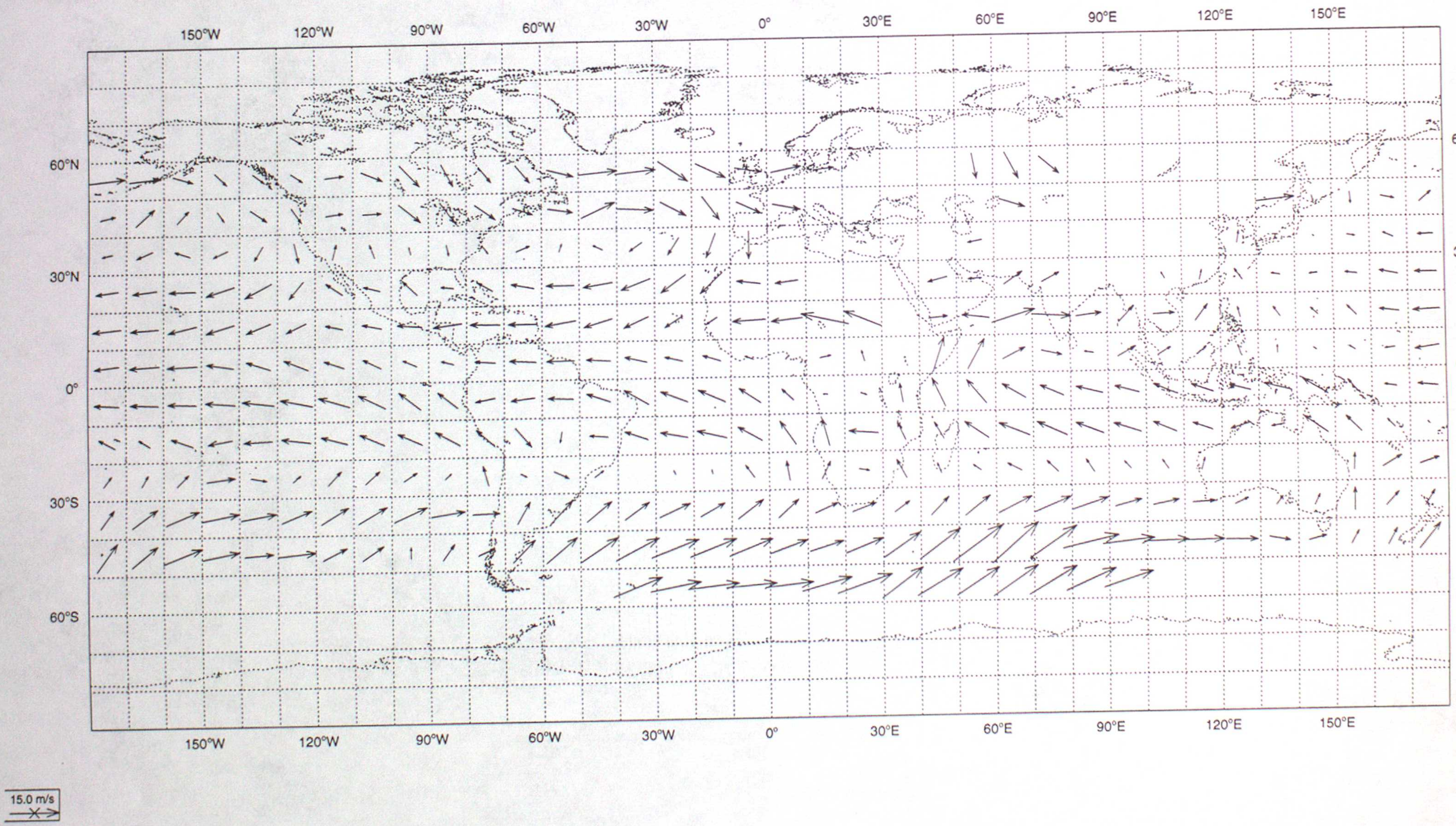
15	20	58	67	77	65	11	21	42	71	107	73	48	32	39	21	23	9	1	0	1	1	1	1	2	1	0	0	0	0		1	3	6	5	3
160	254	504	584	369	112	13	22	30	54	93	128	118	247	300	310	74	4	1	1	0	0	1	1	0	0	0		0	0	2	6	18	17	23	101
326	582	989	1617	994	162	36	24	68	49	133	458	655	970	901	418	28	5	5	1	0	1	3	3	3	2	1	0	0	1	10	19	22	19	29	131
299	487	721	899	558	259	92	63	42	112	100	398	752	952	485	79	3	1	2	1	1	0	2	3	17	7	1	1	1	5	4	7	6	7	11	60
128	244	329	372	450	440	309	286	93	70	22	82	221	237	95	12	15	16	7	2	1	1	27	31	9	6	3	3	3	2	2	5	6	9	10	15
191	340	623	796	918	975	336	1014	753	95	23	60	96	135	479	101	97	100	77	5	1	5	72	74	27	17	6	24	22	11	11	10	4	5	7	18
205	279	348	536	913	1139	648	1149	1191	616	28	21	20	55	539	239	138	146	130	7	2	18	26	121	99	91	61	90	77	31	6	2	19	45	23	37
384	422	283	169	214	284	350	415	454	359	96	5	31	126	330	284	72	89	101	25	1	42	43	86	97	90	77	94	95	20	0	0		39	58	172
403	547	641	526	417	386	515	334	405	363	150	19	150	300	289	191	37	39	51	35	17	40	54	51	62	64	51	54	83	46	37	41	9	49	59	135
173	222	193	168	178	254	380	340	364	287	120	76	232	277	255	83	17	14	14	15	16	19	19	12	16	19	20	14	10	16	21	31	32	46	25	29
														1	2	3	5	4	3	3	3	4	6	5	4	2	1								

Figure 11. SATOB 701 - 1000 hPa vector mean wind. JULY 2001

All observations

Arrows are plotted where greater than 10 obs are present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60°W
30°W
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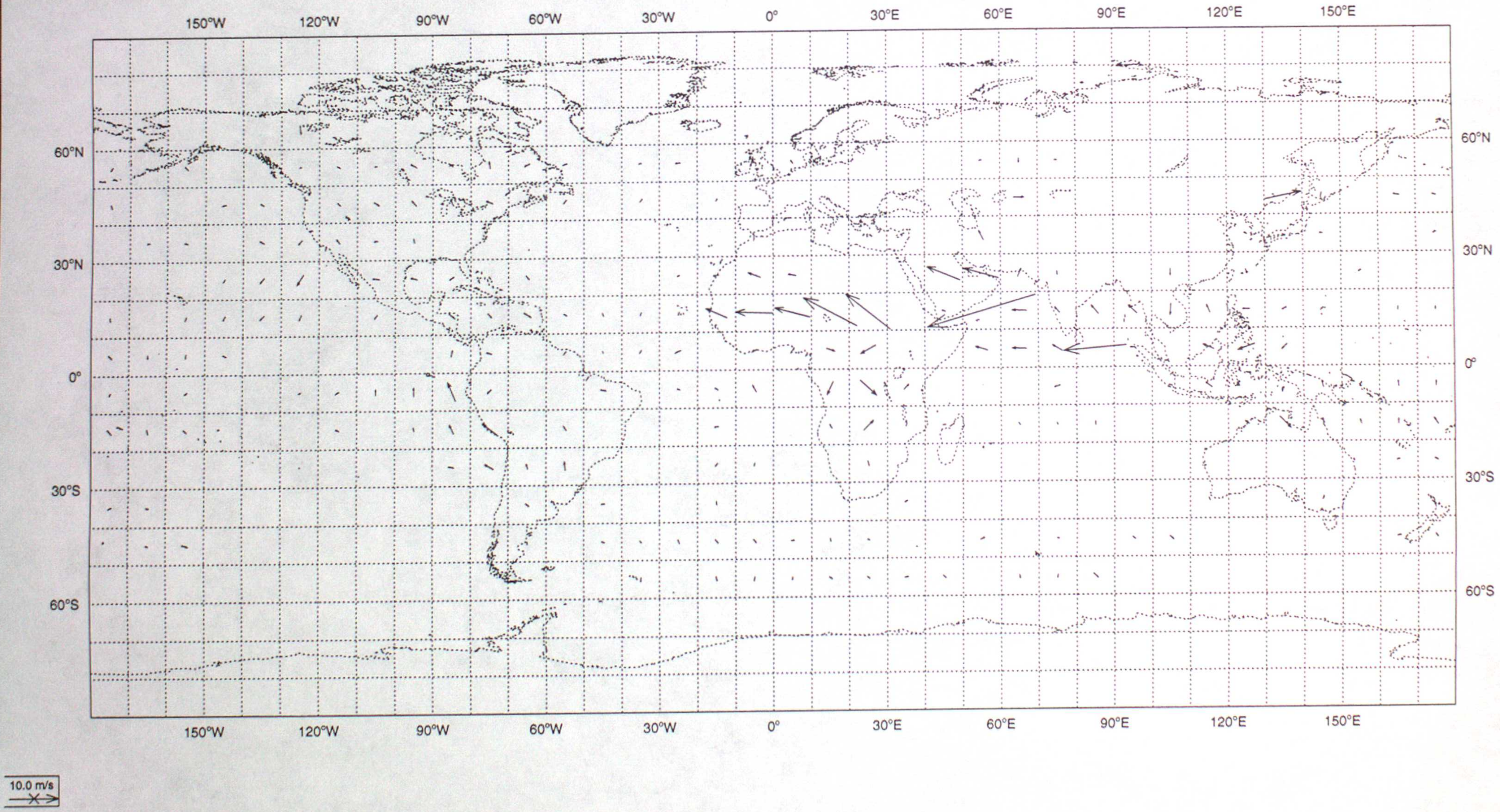
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 12. SATOB 701 - 1000 hPa vector wind differences. JULY 2001
All observations
Arrows are plotted where greater than 10 obs are present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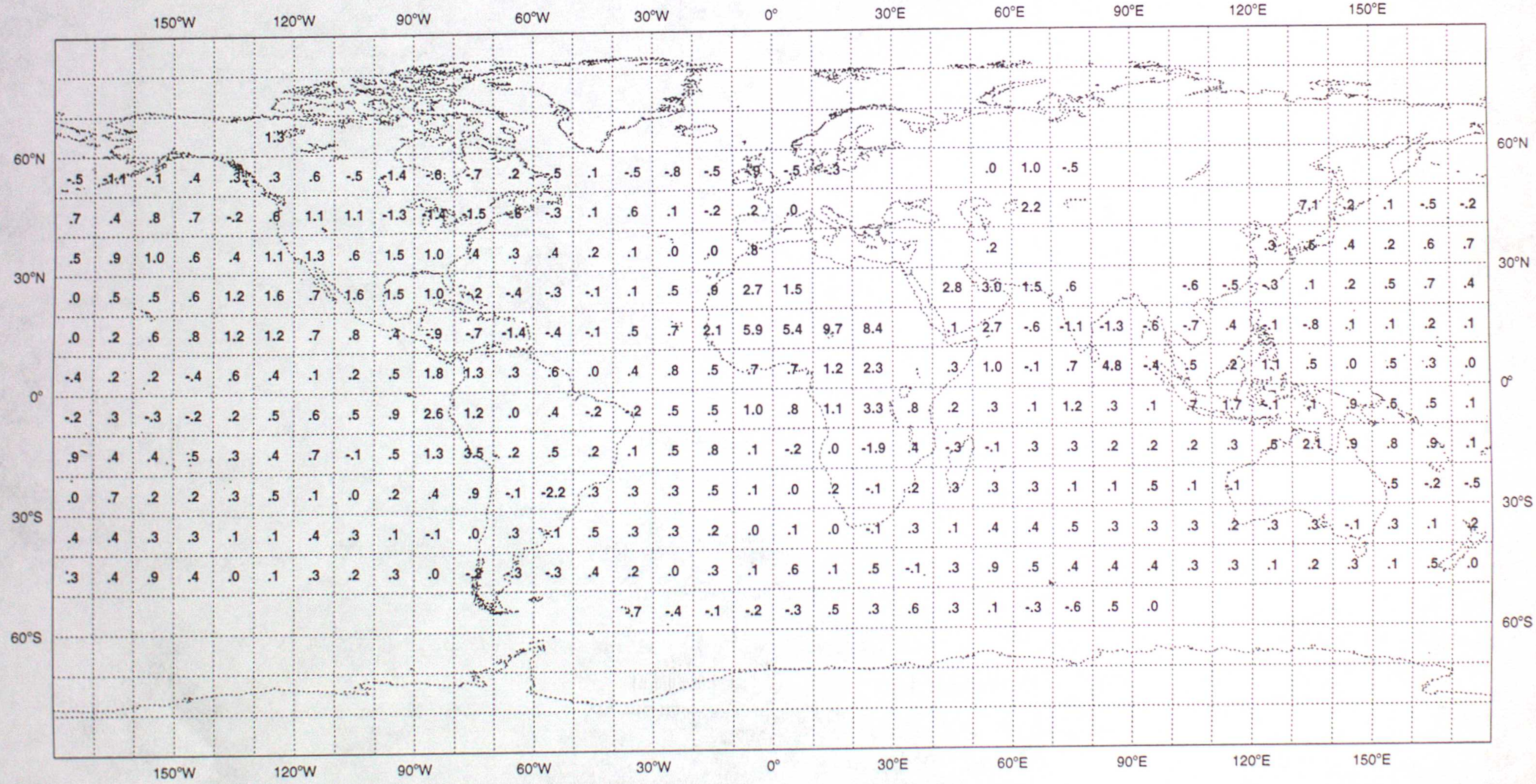
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). JULY 2001

All observations

Values are plotted where greater than 10 obs are present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0°
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60°E
90°E
120°E
150°E
60°N
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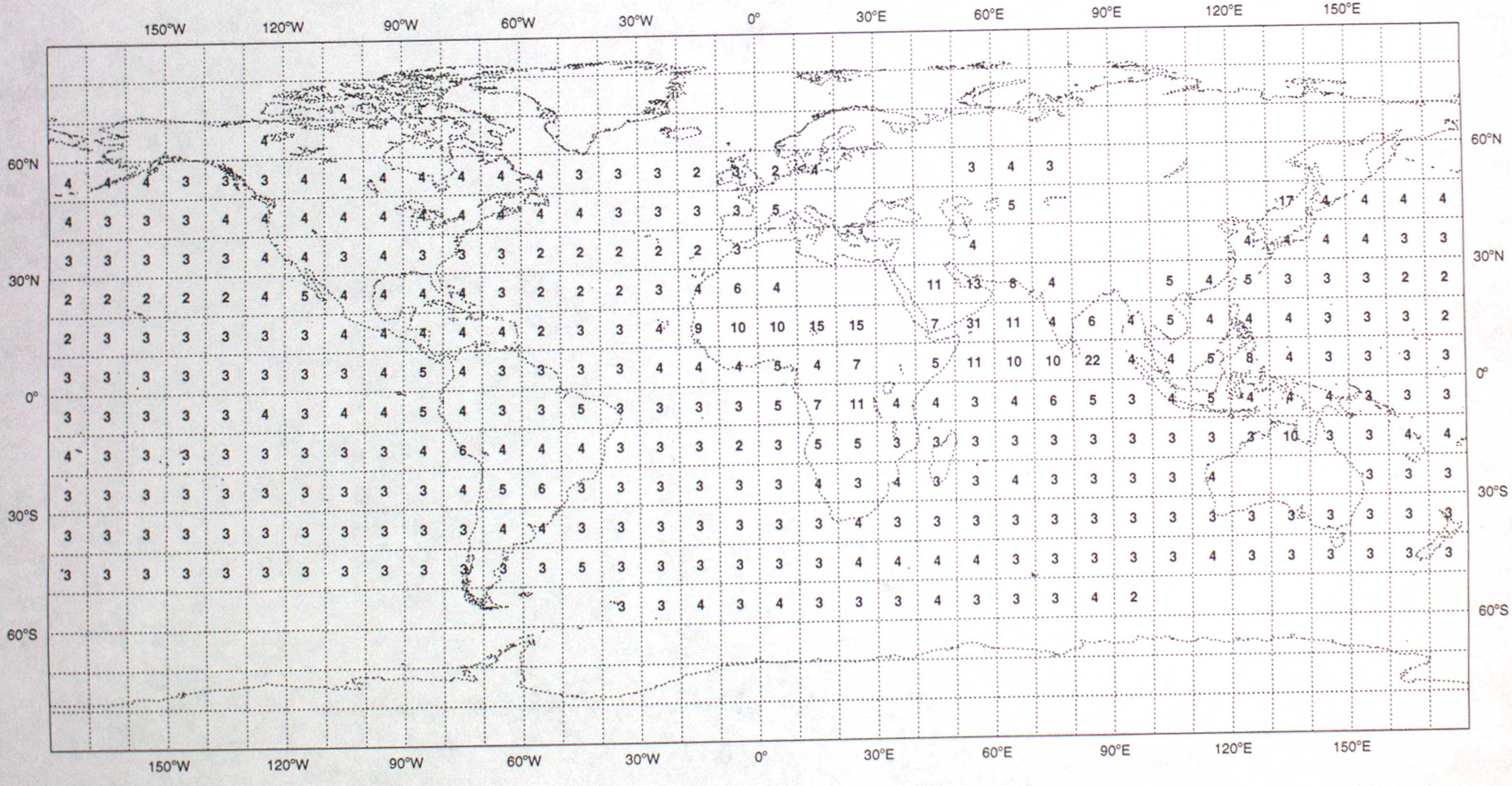
0°
30°S
60°S
1.3
-.5 -1.1 -.1 .4 .3 .3 .6 -.5 -1.4 -.6 -.7 .2 -.5 .1 -.5 -.8 -.5 -.9 -.5 -.3 .0 1.0 -.5
.7 .4 .8 .7 -.2 .6 1.1 1.1 -1.3 -1.4 -1.5 -.6 -.3 .1 .6 .1 -.2 .2 .0 2.2 7.1 .2 .1 -.5 -.2
.5 .9 1.0 .6 .4 1.1 1.3 .6 1.5 1.0 .4 .3 .4 .2 .1 .0 .0 .8 .2 .3 .6 .4 .2 .6 .7
.0 .5 .5 .6 1.2 1.6 .7 1.6 1.5 1.0 -.2 -.4 -.3 -.1 .1 .5 .9 2.7 1.5 2.8 3.0 1.5 .6 -.6 -.5 -.3 .1 .2 .5 .7 .4
.0 .2 .6 .8 1.2 1.2 .7 .8 .4 -.9 -.7 -1.4 -.4 -.1 .5 .7 2.1 5.9 5.4 9.7 8.4 .1 2.7 -.6 -1.1 -1.3 -.6 -.7 .4 -.1 -.8 .1 .1 .2 .1
-.4 .2 .2 -.4 .6 .4 .1 .2 .5 1.8 1.3 .3 .6 .0 .4 .8 .5 .7 .7 1.2 2.3 .3 1.0 -.1 .7 4.8 -.4 .5 .2 1.1 .5 .0 .5 .3 .0
-.2 .3 -.3 -.2 .2 .5 .6 .5 .9 2.6 1.2 .0 .4 -.2 .2 .5 .5 1.0 .8 1.1 3.3 .8 .2 .3 .1 1.2 .3 .1 .7 1.7 .1 .1 .9 .6 .5 .1
.9 .4 .4 .5 .3 .4 .7 -.1 .5 1.3 3.5 .2 .5 .2 .1 .5 .8 .1 -.2 .0 -1.9 .4 -.3 -.1 .3 .3 .2 .2 .2 .3 .5 2.1 .9 .8 .9 .1
.0 .7 .2 .2 .3 .5 .1 .0 .2 .4 .9 -.1 -2.2 .3 .3 .3 .5 .1 .0 .2 -.1 .2 .3 .3 .3 .1 .1 .5 .1 .1 .5 -.2 -.5
.4 .4 .3 .3 .1 .1 .4 .3 .1 -.1 .0 .3 -.1 .5 .3 .3 .2 .0 .1 .0 -.1 .3 .1 .4 .4 .5 .3 .3 .3 .2 .3 .3 -.1 .3 .1 .2
.3 .4 .9 .4 .0 .1 .3 .2 .3 .0 -.2 -.3 -.3 .4 .2 .0 .3 .1 .6 .1 .5 -.1 .3 .9 .5 .4 .4 .4 .3 .3 .1 .2 .3 .1 .5 .0
.7 -.4 -.1 -.2 -.3 .5 .3 .6 .3 .1 -.3 -.6 .5 .0

Figure 14. SATOB 701 - 1000 hPa RMS O-B vector differences (ms-1). JULY 2001

All observations

Values are plotted where greater than 10 obs are present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30°S
60°S
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3 3 3 3 3 3 3 3 4 5 4 3 3 3 3 4 4 4 5 4 7 5 11 10 10 22 4 4 5 8 4 3 3 3 3
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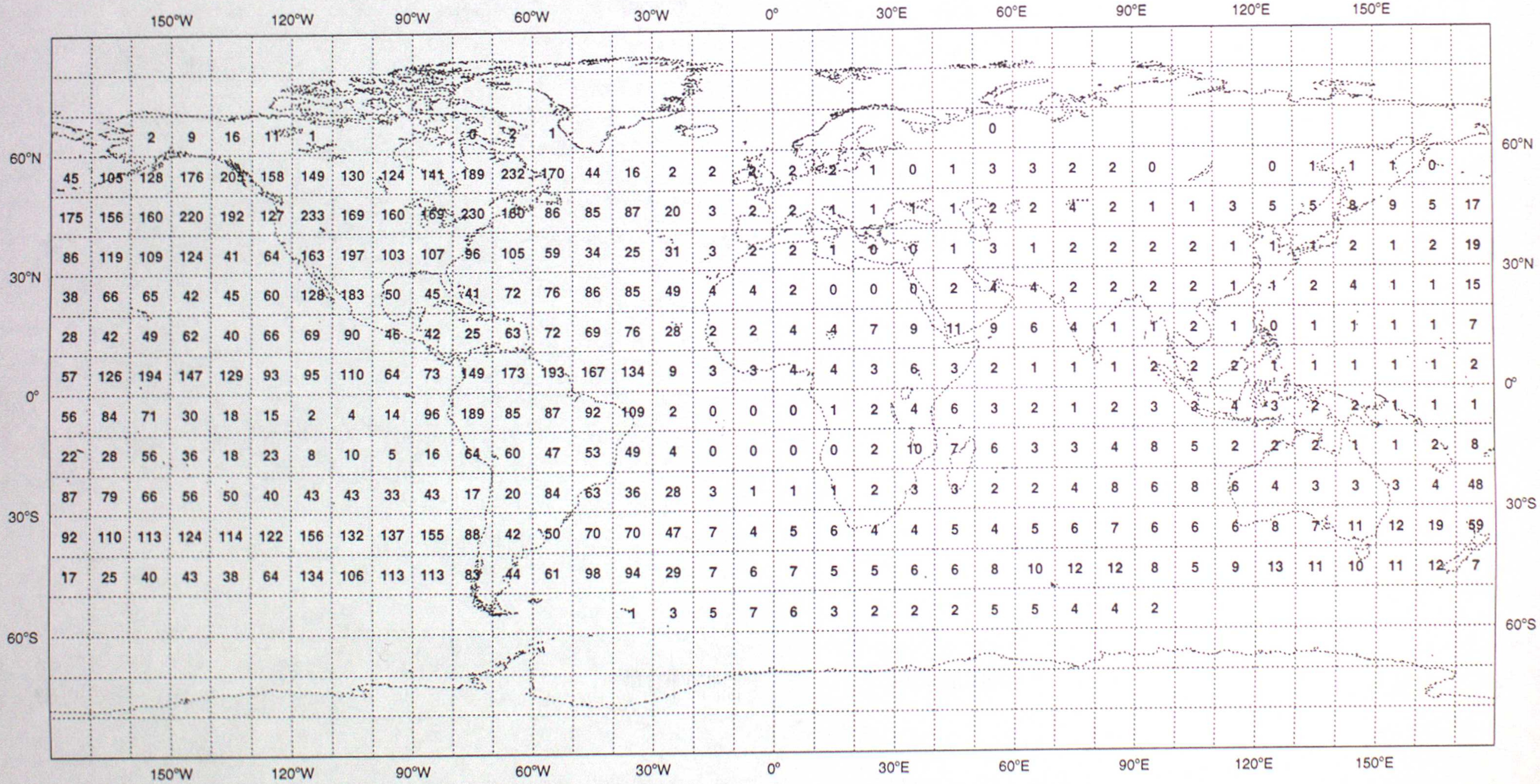
3 3 3 3 3 3 3 3 3 3 3 3 3 5 3 3 3 3 3 3 4 4 4 4 3 3 3 3 3 4 3 3 3 3 3 3
3 3 4 3 4 3 3 3 4 3 3 3 4 2

Figure 15. SATOB 401 - 700 hPa mean daily count. JULY 2001
Global average number of observations in 24 hours = 15775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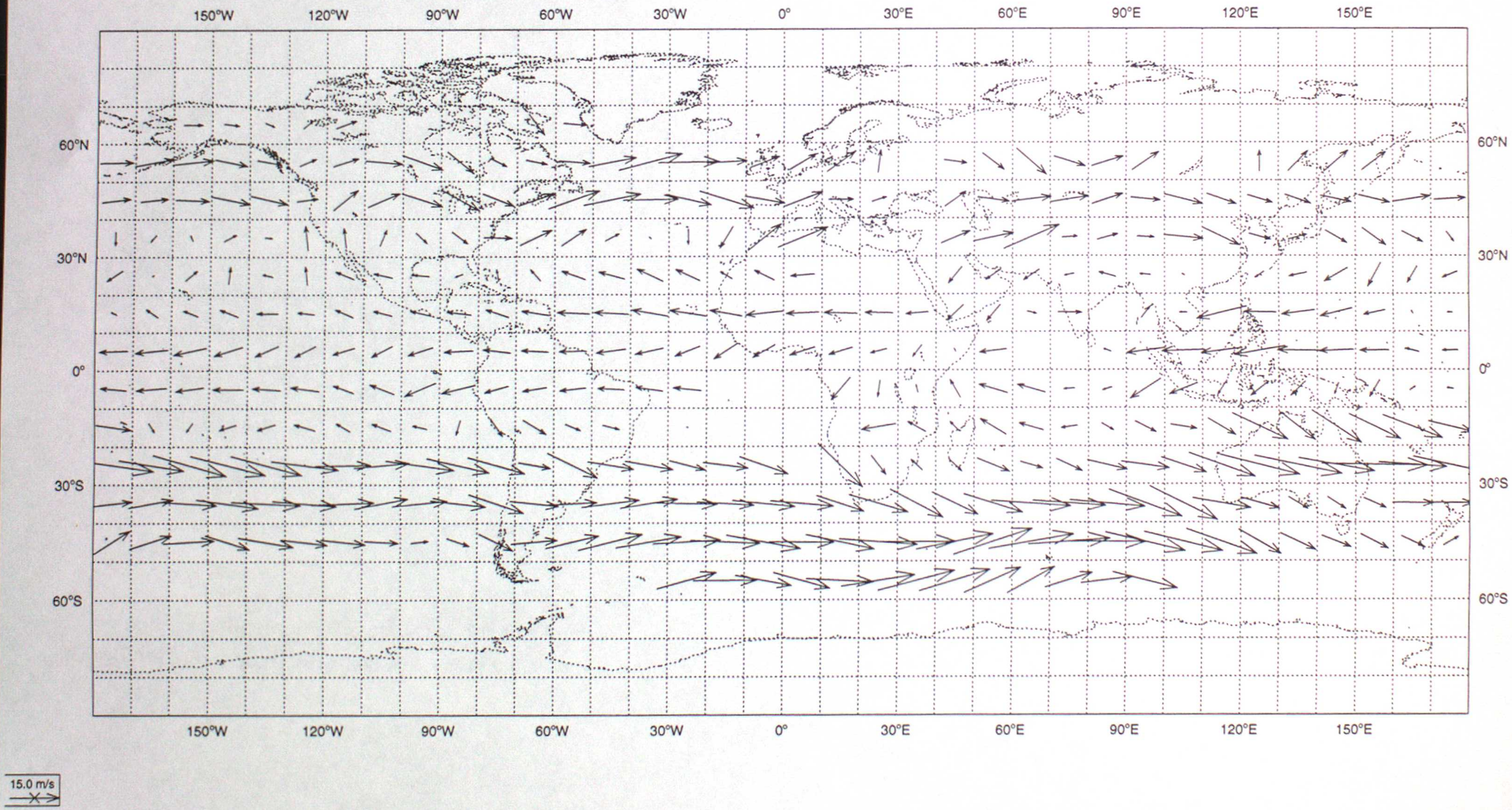
30°N
0°
30°S
60°S
2 9 16 11 1 0 2 1 0
45 105 128 176 205 158 149 130 124 141 189 232 170 44 16 2 2 2 2 2 1 0 1 3 3 2 2 0 0 1 1 1 0
175 156 160 220 192 127 233 169 160 169 230 180 86 85 87 20 3 2 2 1 1 1 1 2 2 4 2 1 1 3 5 5 8 9 5 17
86 119 109 124 41 64 163 197 103 107 96 105 59 34 25 31 3 2 2 1 0 0 1 3 1 2 2 2 2 1 1 1 2 1 2 19
38 66 65 42 45 60 128 183 50 45 41 72 76 86 85 49 4 4 2 0 0 0 2 4 4 2 2 2 2 1 1 2 4 1 1 15
28 42 49 62 40 66 69 90 46 42 25 63 72 69 76 28 2 2 4 4 7 9 11 9 6 4 1 1 2 1 0 1 1 1 1 7
57 126 194 147 129 93 95 110 64 73 149 173 193 167 134 9 3 3 4 4 3 6 3 2 1 1 1 2 2 2 1 1 1 1 1 2
56 84 71 30 18 15 2 4 14 96 189 85 87 92 109 2 0 0 0 1 2 4 6 3 2 1 2 3 3 4 3 2 2 1 1 1
22 28 56 36 18 23 8 10 5 16 64 60 47 53 49 4 0 0 0 0 2 10 7 6 3 3 4 8 5 2 2 2 1 1 2 8
87 79 66 56 50 40 43 43 33 43 17 20 84 63 36 28 3 1 1 1 2 3 3 2 2 4 8 6 8 6 4 3 3 3 4 48
92 110 113 124 114 122 156 132 137 155 88 42 50 70 70 47 7 4 5 6 4 4 5 4 5 6 7 6 6 6 8 7 11 12 19 59
17 25 40 43 38 64 134 106 113 113 83 44 61 98 94 29 7 6 7 5 5 6 6 8 10 12 12 8 5 9 13 11 10 11 12 7
1 3 5 7 6 3 2 2 2 5 5 4 4 2

Figure 16. SATOB 401 - 700 hPa vector mean wind. JULY 2001

All observations

Arrows are plotted where greater than 10 obs are present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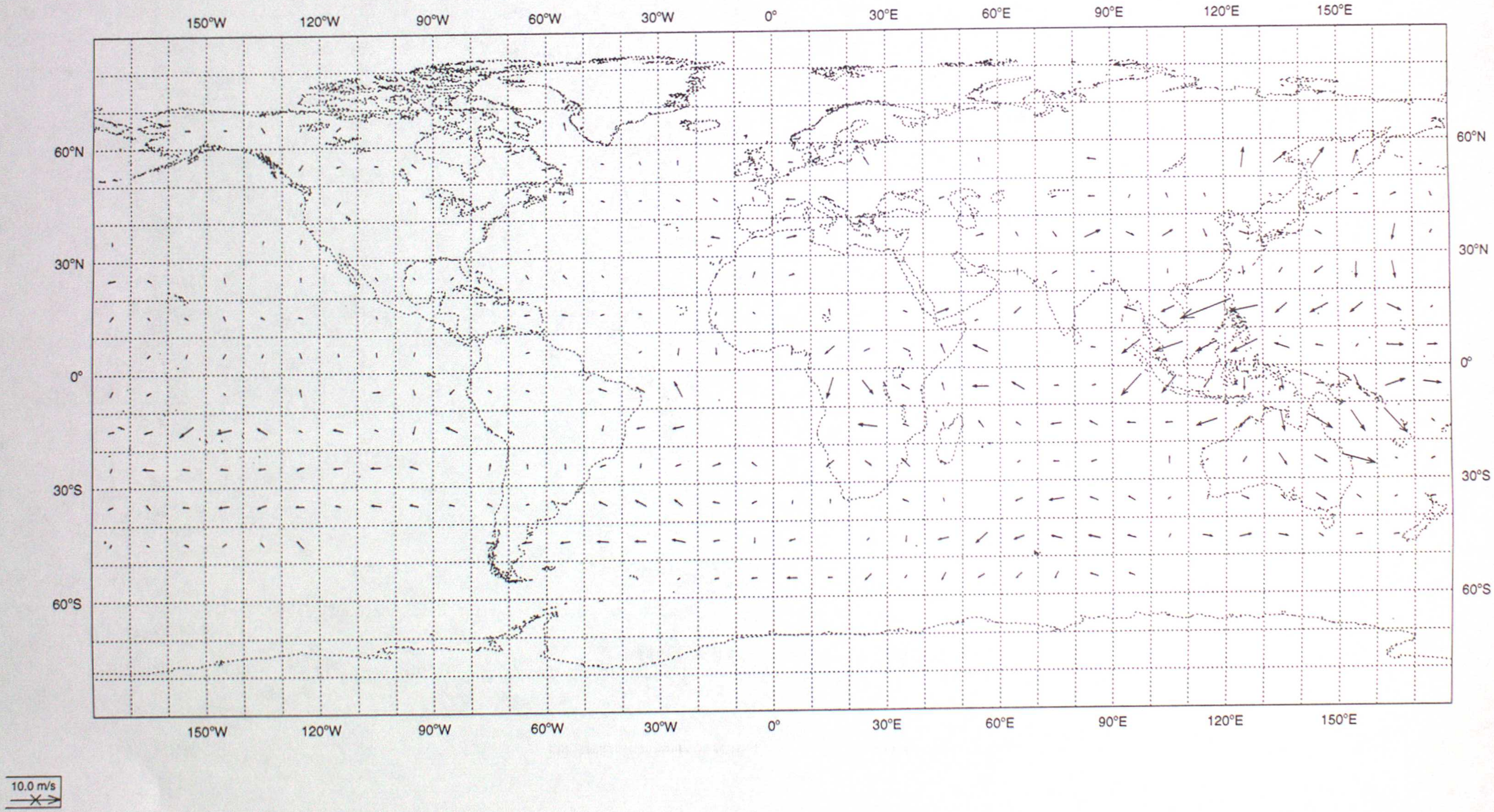
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 17. SATOB 401 - 700 hPa vector wind differences. JULY 2001
All observations
Arrows are plotted where greater than 10 obs are present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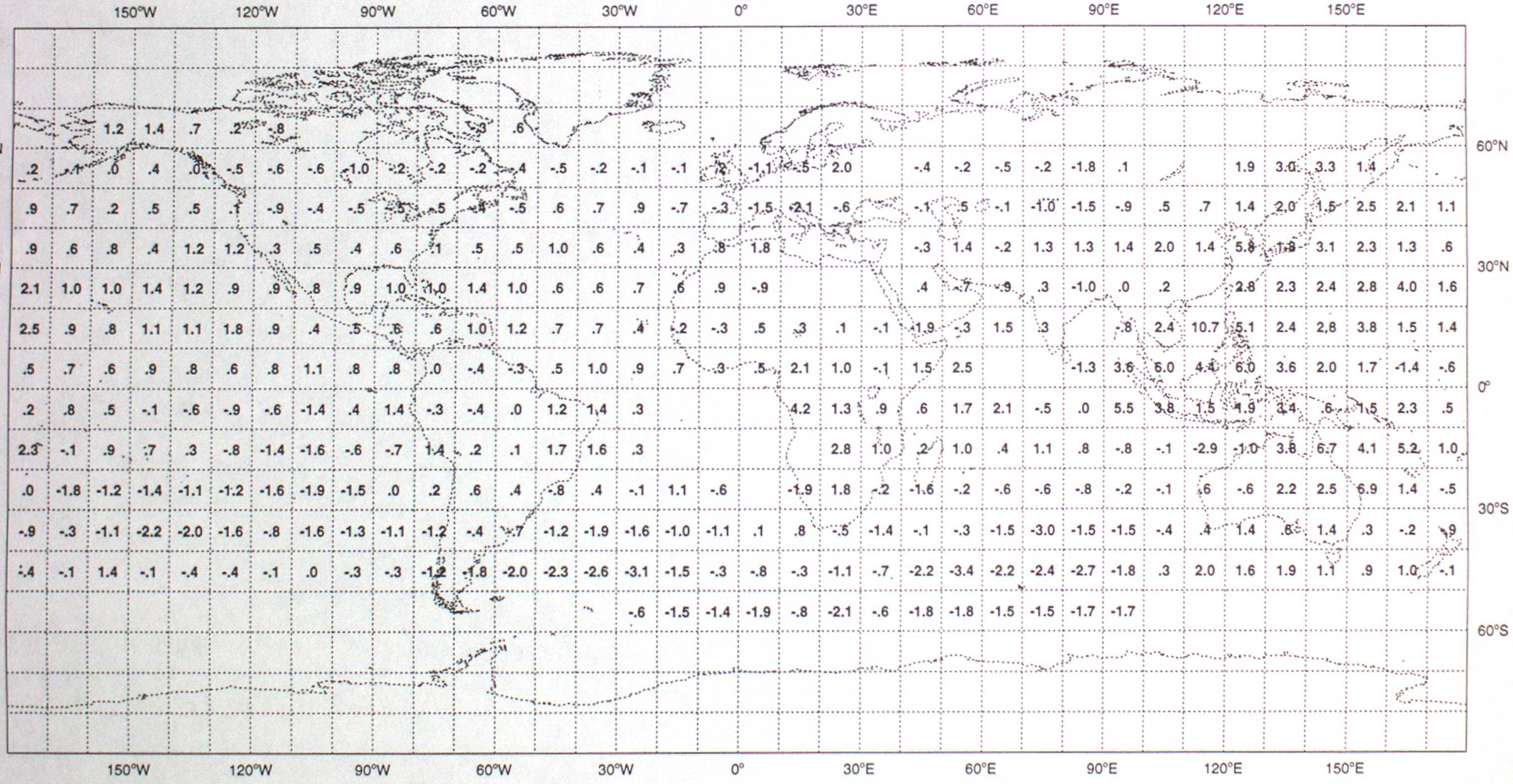
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). JULY 2001

All observations

Values are plotted where greater than 10 obs are present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120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1.2 1.4 .7 .2 -.8 .3 .6
.2 -.1 .0 .4 .0 -.5 -.6 -.6 -1.0 -.2 -.2 -.2 -.4 -.5 -.2 -.1 -.1 .2 -1.1 -.5 2.0 -.4 -.2 -.5 -.2 -1.8 .1 1.9 3.0 3.3 1.4
.9 .7 .2 .5 .5 .1 -.9 -.4 -.5 -.5 -.5 -.4 -.5 .6 .7 .9 -.7 -.3 -1.5 -2.1 -.6 -.1 .5 -.1 -1.0 -1.5 -.9 .5 .7 1.4 2.0 1.5 2.5 2.1 1.1
.9 .6 .8 .4 1.2 1.2 .3 .5 .4 .6 .1 .5 .5 1.0 .6 .4 .3 .8 1.8 -.3 1.4 -.2 1.3 1.3 1.4 2.0 1.4 5.8 1.8 3.1 2.3 1.3 .6
2.1 1.0 1.0 1.4 1.2 .9 .9 .8 .9 1.0 1.0 1.4 1.0 .6 .6 .7 .6 .9 -.9 .4 -.7 -.9 .3 -1.0 .0 .2 2.8 2.3 2.4 2.8 4.0 1.6
2.5 .9 .8 1.1 1.1 1.8 .9 .4 .5 .6 .6 1.0 1.2 .7 .7 .4 -.2 -.3 .5 .3 .1 -.1 -1.9 -.3 1.5 .3 -.8 2.4 10.7 5.1 2.4 2.8 3.8 1.5 1.4
.5 .7 .6 .9 .8 .6 .8 1.1 .8 .8 .0 -.4 -.3 .5 1.0 .9 .7 .3 .5 2.1 1.0 -.1 1.5 2.5 -1.3 3.6 6.0 4.4 6.0 3.6 2.0 1.7 -1.4 -.6
.2 .8 .5 -.1 -.6 -.9 -.6 -1.4 .4 1.4 -.3 -.4 .0 1.2 1.4 .3 4.2 1.3 .9 .6 1.7 2.1 -.5 .0 5.5 3.8 1.5 1.9 3.4 .6 1.5 2.3 .5
2.3 -.1 .9 .7 .3 -.8 -1.4 -1.6 -.6 -.7 1.4 .2 .1 1.7 1.6 .3 2.8 1.0 .2 1.0 .4 1.1 .8 -.8 -.1 -2.9 -1.0 3.8 6.7 4.1 5.2 1.0
.0 -1.8 -1.2 -1.4 -1.1 -1.2 -1.6 -1.9 -1.5 .0 .2 .6 .4 -.8 .4 -.1 1.1 -.6 -1.9 1.8 -.2 -1.6 -.2 -.6 -.6 -.8 -.2 -.1 .6 -.6 2.2 2.5 6.9 1.4 -.5
-.9 -.3 -1.1 -2.2 -2.0 -1.6 -.8 -1.6 -1.3 -1.1 -1.2 -.4 -.7 -1.2 -1.9 -1.6 -1.0 -1.1 .1 .8 -.5 -1.4 -.1 -.3 -1.5 -3.0 -1.5 -1.5 -.4 .4 1.4 .6 1.4 .3 -.2 .9
-.4 -.1 1.4 -.1 -.4 -.4 -.1 .0 -.3 -.3 -1.2 -1.8 -2.0 -2.3 -2.6 -3.1 -1.5 -.3 -.8 -.3 -1.1 -.7 -2.2 -3.4 -2.2 -2.4 -2.7 -1.8 .3 2.0 1.6 1.9 1.1 .9 1.0 -.1
-.6 -1.5 -1.4 -1.9 -.8 -2.1 -.6 -1.8 -1.8 -1.5 -1.5 -1.7 -1.7

Figure 19. SATOB 401 - 700 hPa RMS O-B vector differences (ms-1). JULY 2001

All observations

Values are plotted where greater than 10 obs are present

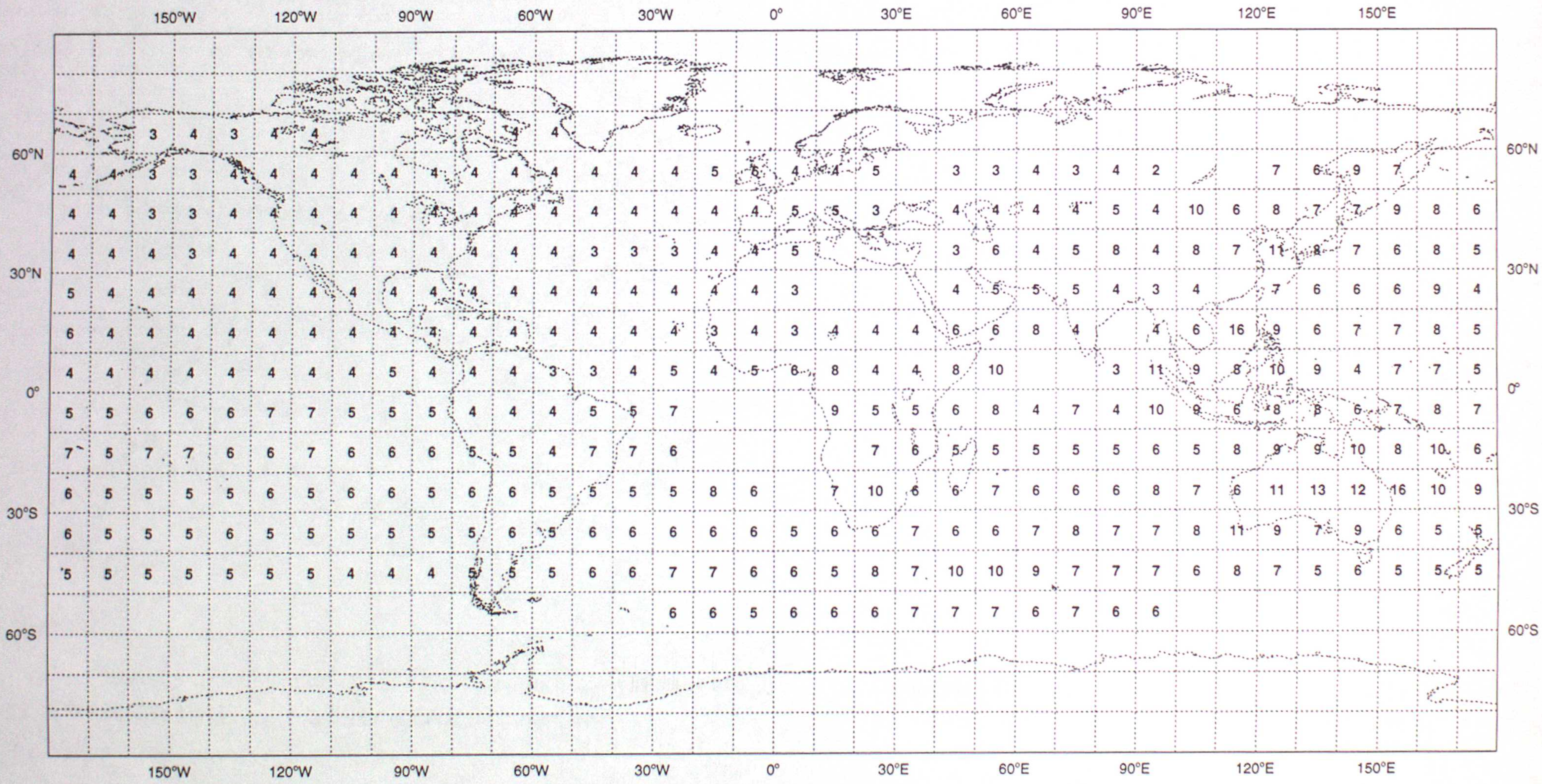

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 20. SATOB 101 - 400 hPa mean daily count. JULY 2001
Global average number of observations in 24 hours = 70707

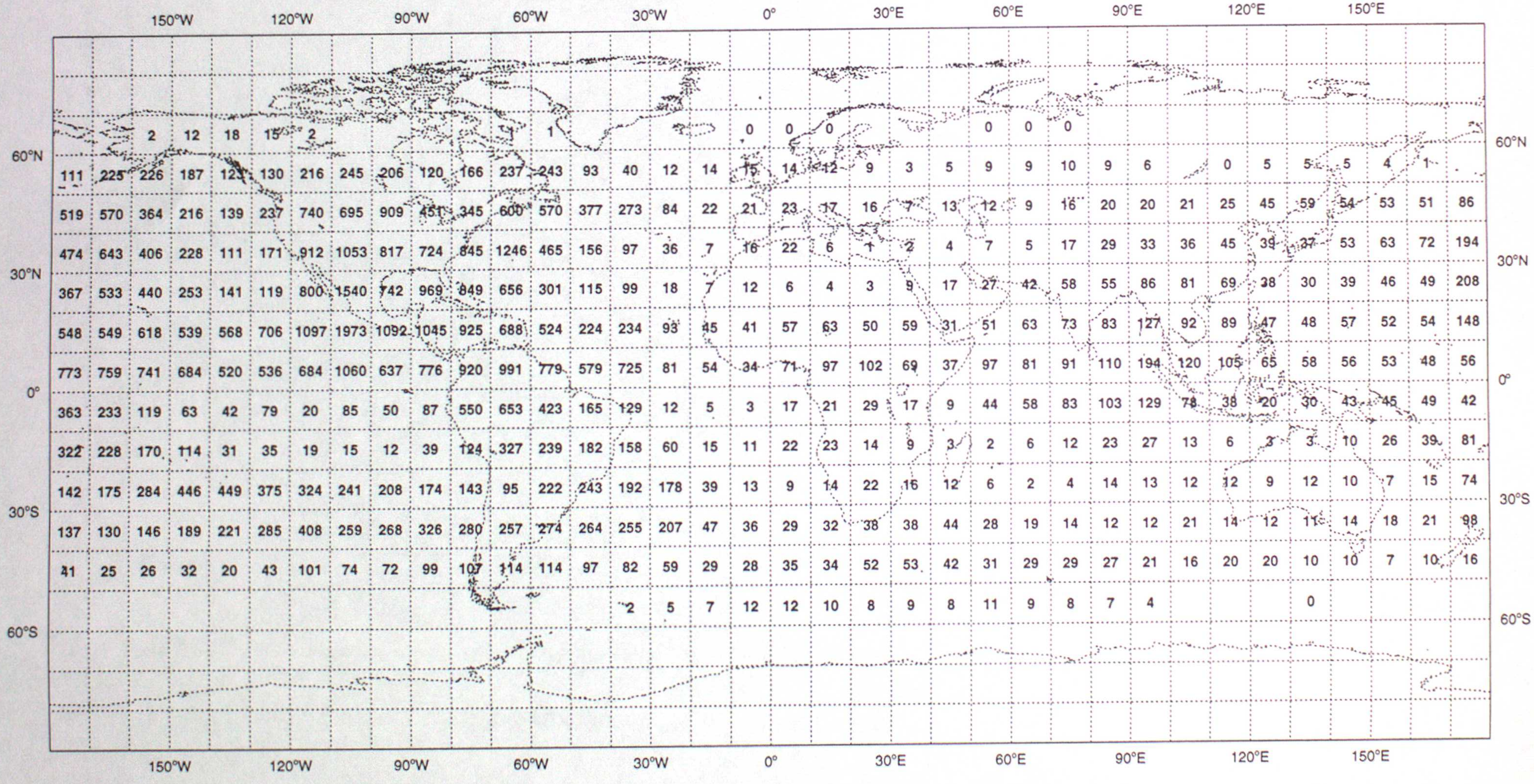

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2 12 18 15 2 1 1 0 0 0 0 0 0
111 225 226 187 123 130 216 245 206 120 166 237 243 93 40 12 14 15 14 12 9 3 5 9 9 10 9 6 0 5 5 5 4 1
519 570 364 216 139 237 740 695 909 451 345 600 570 377 273 84 22 21 23 17 16 7 13 12 9 16 20 20 21 25 45 59 54 53 51 86
474 643 406 228 111 171 912 1053 817 724 845 1246 465 156 97 36 7 16 22 6 1 2 4 7 5 17 29 33 36 45 39 37 53 63 72 194
367 533 440 253 141 119 800 1540 742 969 849 656 301 115 99 18 7 12 6 4 3 9 17 27 42 58 55 86 81 69 38 30 39 46 49 208
548 549 618 539 568 706 1097 1973 1092 1045 925 688 524 224 234 93 45 41 57 63 50 59 31 51 63 73 83 127 92 89 47 48 57 52 54 148
773 759 741 684 520 536 684 1060 637 776 920 991 779 579 725 81 54 34 71 97 102 69 37 97 81 91 110 194 120 105 65 58 56 53 48 56
363 233 119 63 42 79 20 85 50 87 550 653 423 165 129 12 5 3 17 21 29 17 9 44 58 83 103 129 78 38 20 30 43 45 49 42
322 228 170 114 31 35 19 15 12 39 124 327 239 182 158 60 15 11 22 23 14 9 3 2 6 12 23 27 13 6 3 3 10 26 39 81
142 175 284 446 449 375 324 241 208 174 143 95 222 243 192 178 39 13 9 14 22 16 12 6 2 4 14 13 12 12 9 12 10 7 15 74
137 130 146 189 221 285 408 259 268 326 280 257 274 264 255 207 47 36 29 32 38 38 44 28 19 14 12 12 21 14 12 11 14 18 21 98
41 25 26 32 20 43 101 74 72 99 107 114 114 97 82 59 29 28 35 34 52 53 42 31 29 29 27 21 16 20 20 10 10 7 10 16
2 5 7 12 12 10 8 9 8 11 9 8 7 4 0

Figure 21. SATOB 101 - 400 hPa vector mean wind. JULY 2001

All observations

Arrows are plotted where greater than 10 obs are present

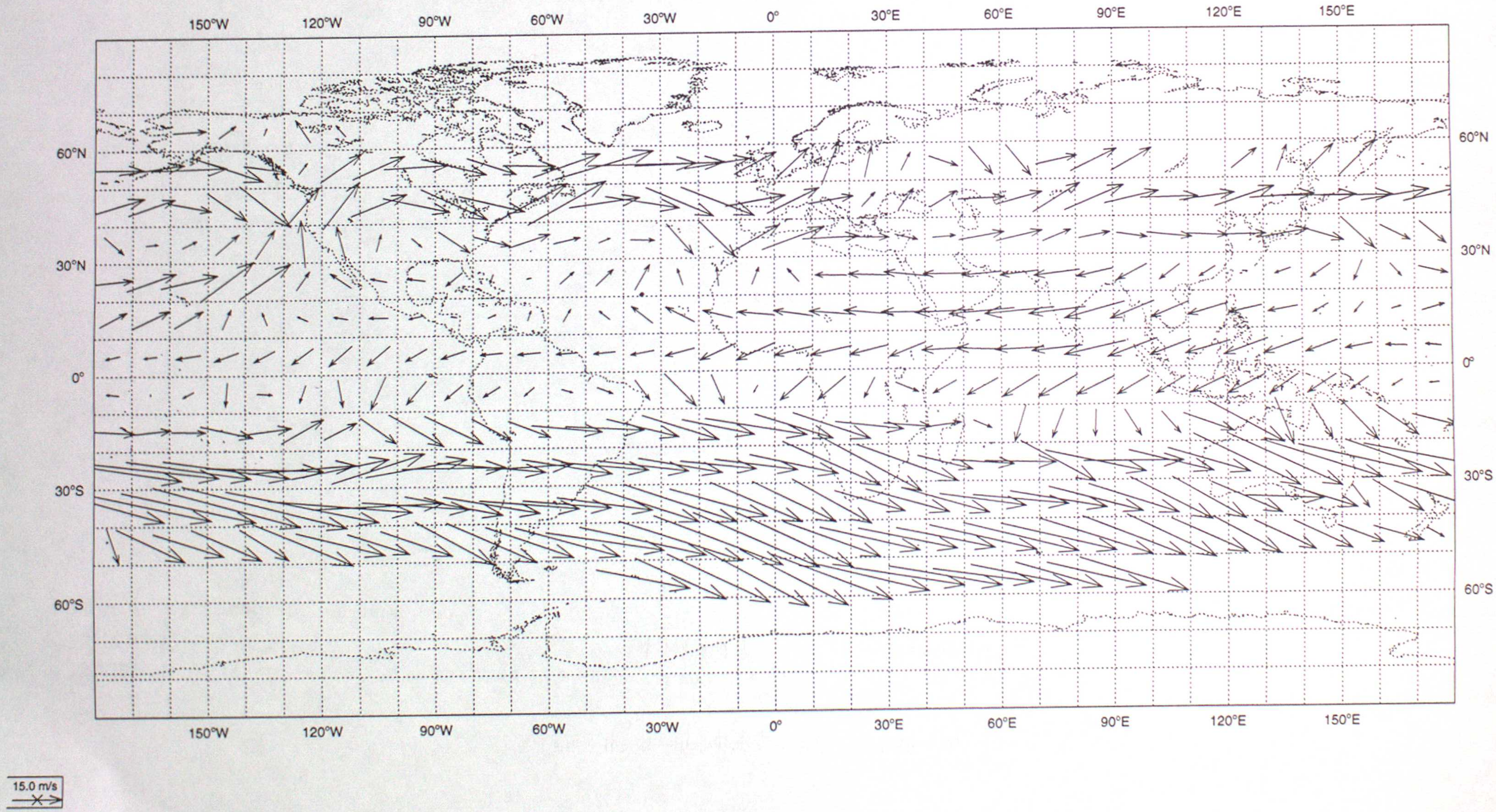

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 22. SATOB 101 - 400 hPa vector wind differences. JULY 2001
All observations
Arrows are plotted where greater than 10 obs are present

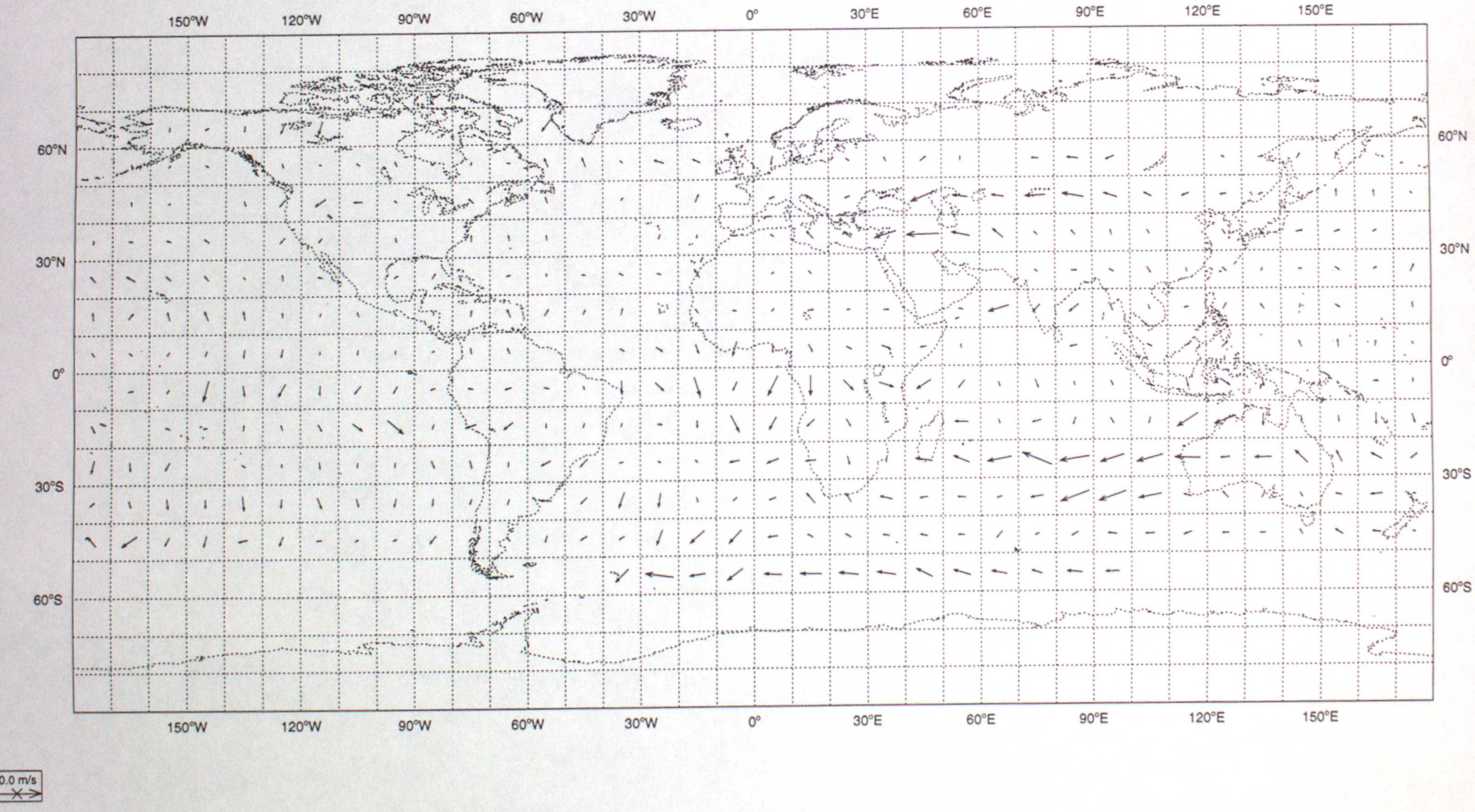

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). JULY 2001
All observations
Values are plotted where greater than 10 obs are present

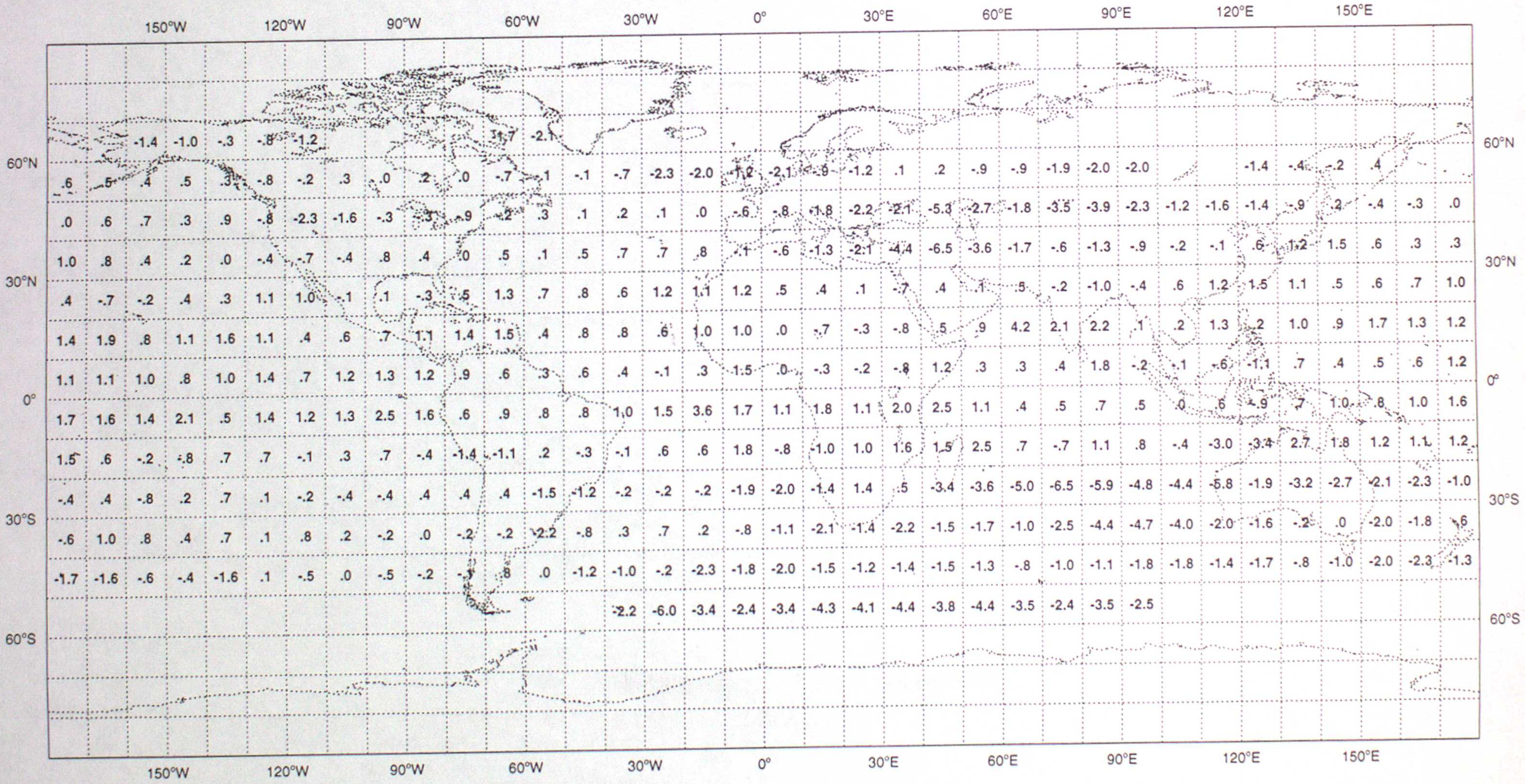
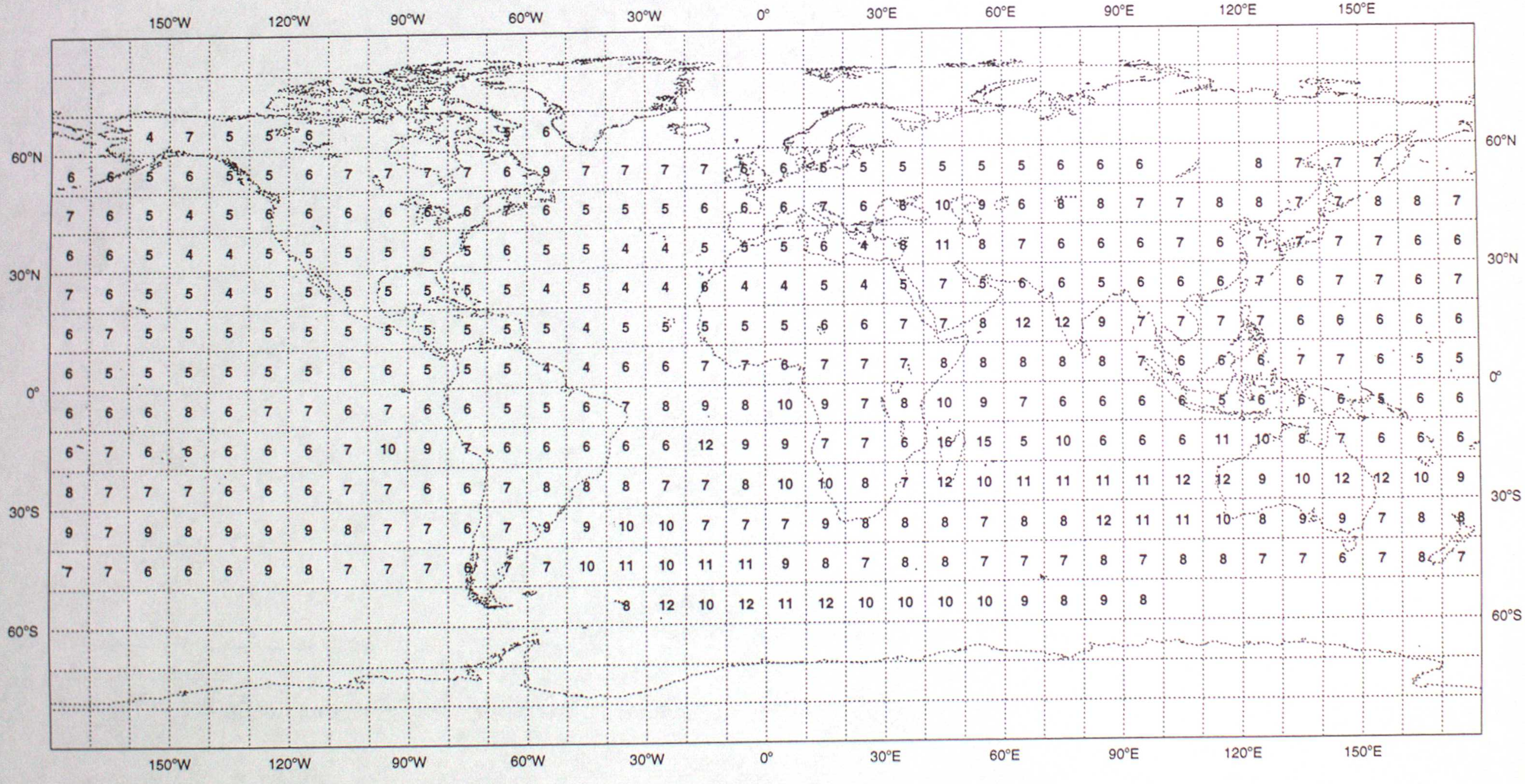

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-1.4 -1.0 -.3 -.8 -1.2 1.7 -2.1
.6 .5 .4 .5 .3 -.8 -.2 .3 .0 .2 .0 -.7 .1 -.1 -.7 -2.3 -2.0 -1.2 -2.1 -.9 -1.2 .1 .2 -.9 -.9 -1.9 -2.0 -2.0 -1.4 -.4 -.2 .4
.0 .6 .7 .3 .9 -.8 -2.3 -1.6 -.3 -.3 -.9 .2 .3 .1 .2 .1 .0 -.6 -.8 -1.8 -2.2 -2.1 -5.3 -2.7 -1.8 -3.5 -3.9 -2.3 -1.2 -1.6 -1.4 -.9 .2 -.4 -.3 .0
1.0 .8 .4 .2 .0 -.4 -.7 -.4 .8 .4 .0 .5 .1 .5 .7 .7 .8 -.1 -.6 -1.3 -2.1 -4.4 -6.5 -3.6 -1.7 -.6 -1.3 -.9 -.2 -.1 .6 1.2 1.5 .6 .3 .3
.4 -.7 -.2 .4 .3 1.1 1.0 -.1 .1 -.3 .5 1.3 .7 .8 .6 1.2 1.1 1.2 .5 .4 .1 -.7 .4 .1 .5 -.2 -1.0 -.4 .6 1.2 1.5 1.1 .5 .6 .7 1.0
1.4 1.9 .8 1.1 1.6 1.1 .4 .6 .7 1.1 1.4 1.5 .4 .8 .8 .6 1.0 1.0 .0 -.7 -.3 -.8 .5 .9 4.2 2.1 2.2 .1 .2 1.3 .2 1.0 .9 1.7 1.3 1.2
1.1 1.1 1.0 .8 1.0 1.4 .7 1.2 1.3 1.2 .9 .6 .3 .6 .4 -.1 .3 1.5 .0 -.3 -.2 -.8 1.2 .3 .3 .4 1.8 -.2 -.1 -.6 -1.1 .7 .4 .5 .6 1.2
1.7 1.6 1.4 2.1 .5 1.4 1.2 1.3 2.5 1.6 .6 .9 .8 .8 1.0 1.5 3.6 1.7 1.1 1.8 1.1 2.0 2.5 1.1 .4 .5 .7 .5 .0 .6 .9 .7 1.0 .8 1.0 1.6
1.5 .6 -.2 -.8 .7 .7 -.1 .3 .7 -.4 -1.4 -1.1 .2 -.3 -.1 .6 .6 1.8 -.8 -1.0 1.0 1.6 1.5 2.5 .7 -.7 1.1 .8 -.4 -3.0 -3.4 2.7 1.8 1.2 1.1 1.2
-.4 .4 -.8 .2 .7 .1 -.2 -.4 -.4 .4 .4 .4 -1.5 -1.2 -.2 -.2 -.2 -1.9 -2.0 -1.4 1.4 .5 -3.4 -3.6 -5.0 -6.5 -5.9 -4.8 -4.4 -5.8 -1.9 -3.2 -2.7 -2.1 -2.3 -1.0
-.6 1.0 .8 .4 .7 .1 .8 .2 -.2 .0 -.2 -.2 -2.2 -.8 .3 .7 .2 -.8 -1.1 -2.1 -1.4 -2.2 -1.5 -1.7 -1.0 -2.5 -4.4 -4.7 -4.0 -2.0 -1.6 -.2 .0 -2.0 -1.8 .6
-1.7 -1.6 -.6 -.4 -1.6 .1 -.5 .0 -.5 -.2 -.1 .8 .0 -1.2 -1.0 -.2 -2.3 -1.8 -2.0 -1.5 -1.2 -1.4 -1.5 -1.3 -.8 -1.0 -1.1 -1.8 -1.8 -1.4 -1.7 -.8 -1.0 -2.0 -2.3 -1.3
-2.2 -6.0 -3.4 -2.4 -3.4 -4.3 -4.1 -4.4 -3.8 -4.4 -3.5 -2.4 -3.5 -2.5

Figure 24. SATOB 101 - 400 hPa RMS O-B vector differences (ms-1). JULY 2001

All observations

Values are plotted where greater than 10 obs are present


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4 7 5 5 6 6
6 6 5 6 5 5 6 7 7 7 7 6 9 7 7 7 7 6 6 5 5 5 5 5 5 6 6 6 8 7 7 7
7 6 5 4 5 6 6 6 6 6 6 7 6 5 5 5 6 6 6 7 6 8 10 9 6 8 8 7 7 8 8 7 7 8 8 7
6 6 5 4 4 5 5 5 5 5 5 6 5 5 4 4 5 5 5 6 4 8 11 8 7 6 6 6 7 6 7 7 7 7 6 6
7 6 5 5 4 5 5 5 5 5 5 5 4 5 4 4 6 4 4 5 4 5 7 5 6 6 5 6 6 6 7 6 7 7 6 7
6 7 5 5 5 5 5 5 5 5 5 5 5 4 5 5 5 5 5 6 6 7 7 8 12 12 9 7 7 7 7 6 6 6 6 6
6 5 5 5 5 5 5 6 6 5 5 5 4 4 6 6 7 7 6 7 7 7 8 8 8 8 8 7 6 6 6 7 7 6 5 5
6 6 6 8 6 7 7 6 7 6 6 5 5 6 7 8 9 8 10 9 7 8 10 9 7 6 6 6 6 5 6 6 6 5 6 6
6 7 6 6 6 6 6 7 10 9 7 6 6 6 6 6 12 9 9 7 7 6 16 15 5 10 6 6 6 11 10 8 7 6 6 6
8 7 7 7 6 6 6 7 7 6 6 7 8 8 8 7 7 8 10 10 8 7 12 10 11 11 11 11 12 12 9 10 12 12 10 9
9 7 9 8 9 9 9 8 7 7 6 7 9 9 10 10 7 7 7 9 8 8 8 7 8 8 12 11 11 10 8 9 9 7 8 8
7 7 6 6 6 9 8 7 7 7 6 7 7 10 11 10 11 11 9 8 7 8 8 7 7 7 8 7 8 8 7 7 6 7 8 7
8 12 10 12 11 12 10 10 10 10 9 8 9 8

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: July 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-15 and NOAA-16.

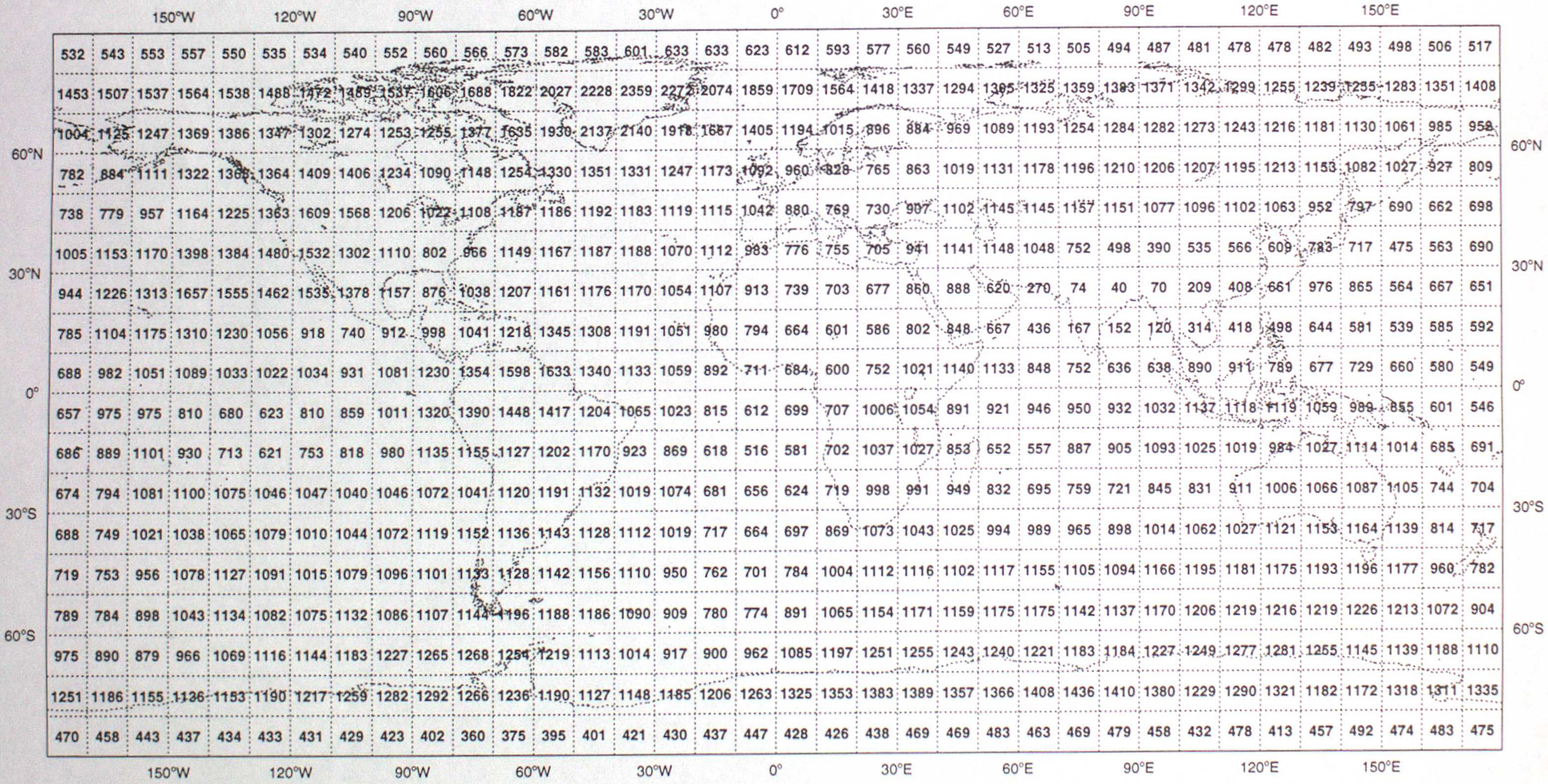
Standard of comparison :Background field from UKMO global model.

Selection Criteria :All soundings.

Data Extracted :Sounding channels (and approximate weighting function peaks, hPa)
HIRS8 (Surface)
HIRS15 (700)
HIRS11 (500-700)
HIRS4 (400)
AMSUA5 (700)
AMSUA7 (300)
AMSUA9 (100)

:Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. JULY 2001
NOAA15, using all observations
Global average number of observations in 24 hours = 644424

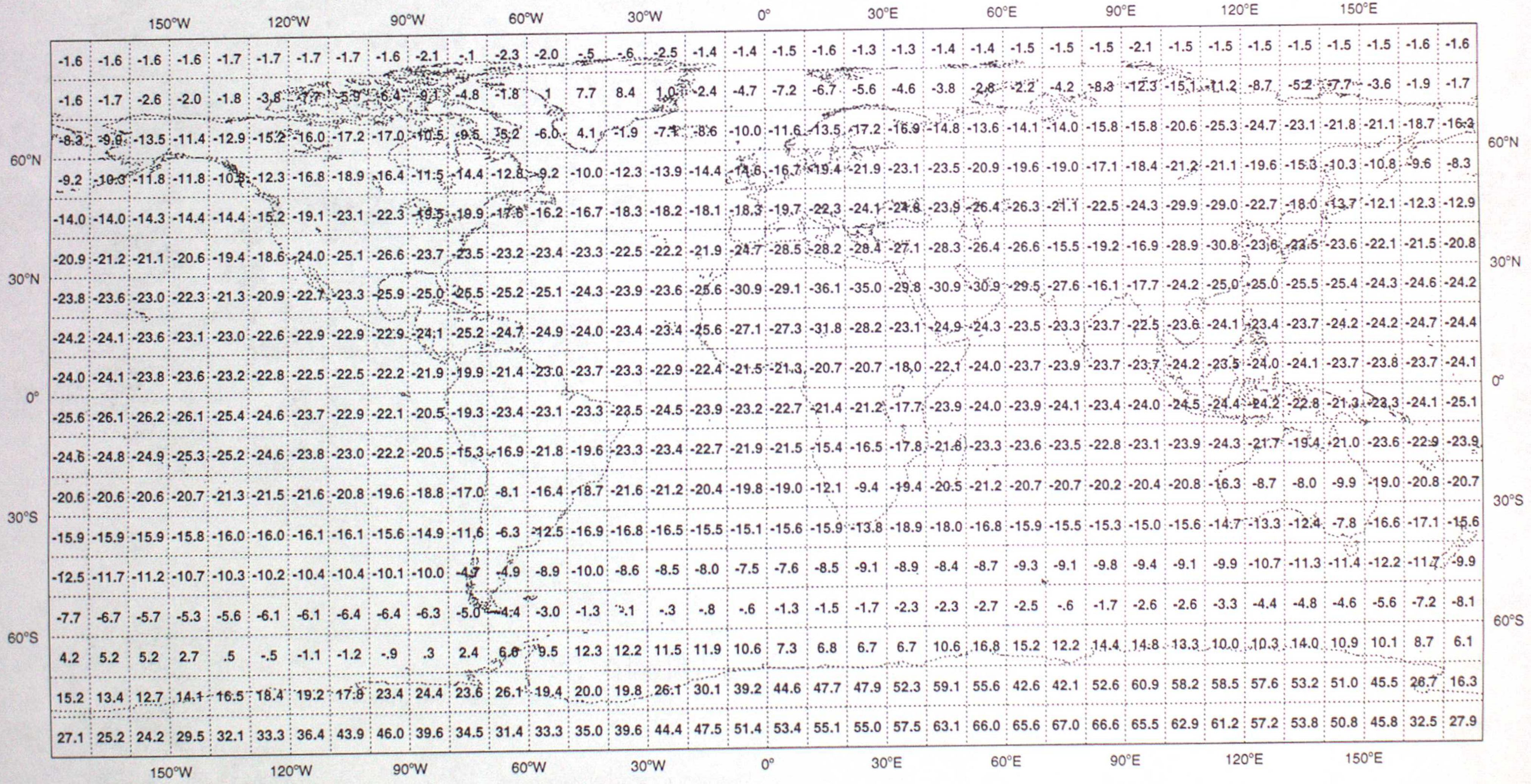


532	543	553	557	550	535	534	540	552	560	566	573	582	583	601	633	633	623	612	593	577	560	549	527	513	505	494	487	481	478	478	482	493	498	506	517
1453	1507	1537	1564	1538	1488	1472	1489	1537	1606	1688	1822	2027	2228	2359	2272	2074	1859	1709	1564	1418	1337	1294	1305	1325	1359	1383	1371	1342	1299	1255	1239	1235	1283	1351	1408
1004	1125	1247	1369	1386	1347	1302	1274	1253	1255	1377	1635	1930	2137	2140	1918	1687	1405	1194	1015	896	884	969	1089	1193	1254	1284	1282	1273	1243	1216	1181	1130	1061	985	958
782	884	1111	1322	1368	1364	1409	1406	1234	1090	1148	1254	1330	1351	1331	1247	1173	1092	960	828	765	863	1019	1131	1178	1196	1210	1206	1207	1195	1213	1153	1082	1027	927	809
738	779	957	1164	1225	1363	1609	1568	1206	1022	1108	1187	1186	1192	1183	1119	1115	1042	880	769	730	907	1102	1145	1145	1157	1151	1077	1096	1102	1063	952	797	690	662	698
1005	1153	1170	1398	1384	1480	1532	1302	1110	802	966	1149	1167	1187	1188	1070	1112	983	776	755	705	941	1141	1148	1048	752	498	390	535	566	609	783	717	475	563	690
944	1226	1313	1657	1555	1462	1535	1378	1157	876	1038	1207	1161	1176	1170	1054	1107	913	739	703	677	860	888	620	270	74	40	70	209	408	661	976	865	564	667	651
785	1104	1175	1310	1230	1056	918	740	912	998	1041	1218	1345	1308	1191	1051	980	794	664	601	586	802	848	667	436	167	152	120	314	418	498	644	581	539	585	592
688	982	1051	1089	1033	1022	1034	931	1081	1230	1354	1598	1633	1340	1133	1059	892	711	684	600	752	1021	1140	1133	848	752	636	638	890	911	789	677	729	660	580	549
657	975	975	810	680	623	810	859	1011	1320	1390	1448	1417	1204	1065	1023	815	612	699	707	1006	1054	891	921	946	950	932	1032	1137	1118	1119	1059	989	855	601	546
686	889	1101	930	713	621	753	818	980	1135	1155	1127	1202	1170	923	869	618	516	581	702	1037	1027	853	652	557	887	905	1093	1025	1019	984	1027	1114	1014	685	691
674	794	1081	1100	1075	1046	1047	1040	1046	1072	1041	1120	1191	1132	1019	1074	681	656	624	719	998	991	949	832	695	759	721	845	831	911	1006	1066	1087	1105	744	704
688	749	1021	1038	1065	1079	1010	1044	1072	1119	1152	1136	1143	1128	1112	1019	717	664	697	869	1073	1043	1025	994	989	965	898	1014	1062	1027	1121	1153	1164	1139	814	717
719	753	956	1078	1127	1091	1015	1079	1096	1101	1133	1128	1142	1156	1110	950	762	701	784	1004	1112	1116	1102	1117	1155	1105	1094	1166	1195	1181	1175	1193	1196	1177	960	782
789	784	898	1043	1134	1082	1075	1132	1086	1107	1144	1196	1188	1186	1090	909	780	774	891	1065	1154	1171	1159	1175	1175	1142	1137	1170	1206	1219	1216	1219	1226	1213	1072	904
975	890	879	966	1069	1116	1144	1183	1227	1265	1268	1254	1219	1113	1014	917	900	962	1085	1197	1251	1255	1243	1240	1221	1183	1184	1227	1249	1277	1281	1255	1145	1139	1188	1110
1251	1186	1155	1136	1153	1190	1217	1259	1282	1292	1266	1236	1190	1127	1148	1185	1206	1263	1325	1353	1383	1389	1357	1366	1408	1436	1410	1380	1229	1290	1321	1182	1172	1318	1311	1335
470	458	443	437	434	433	431	429	423	402	360	375	395	401	421	430	437	447	428	426	438	469	469	483	463	469	479	458	432	478	413	457	492	474	483	475

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2001

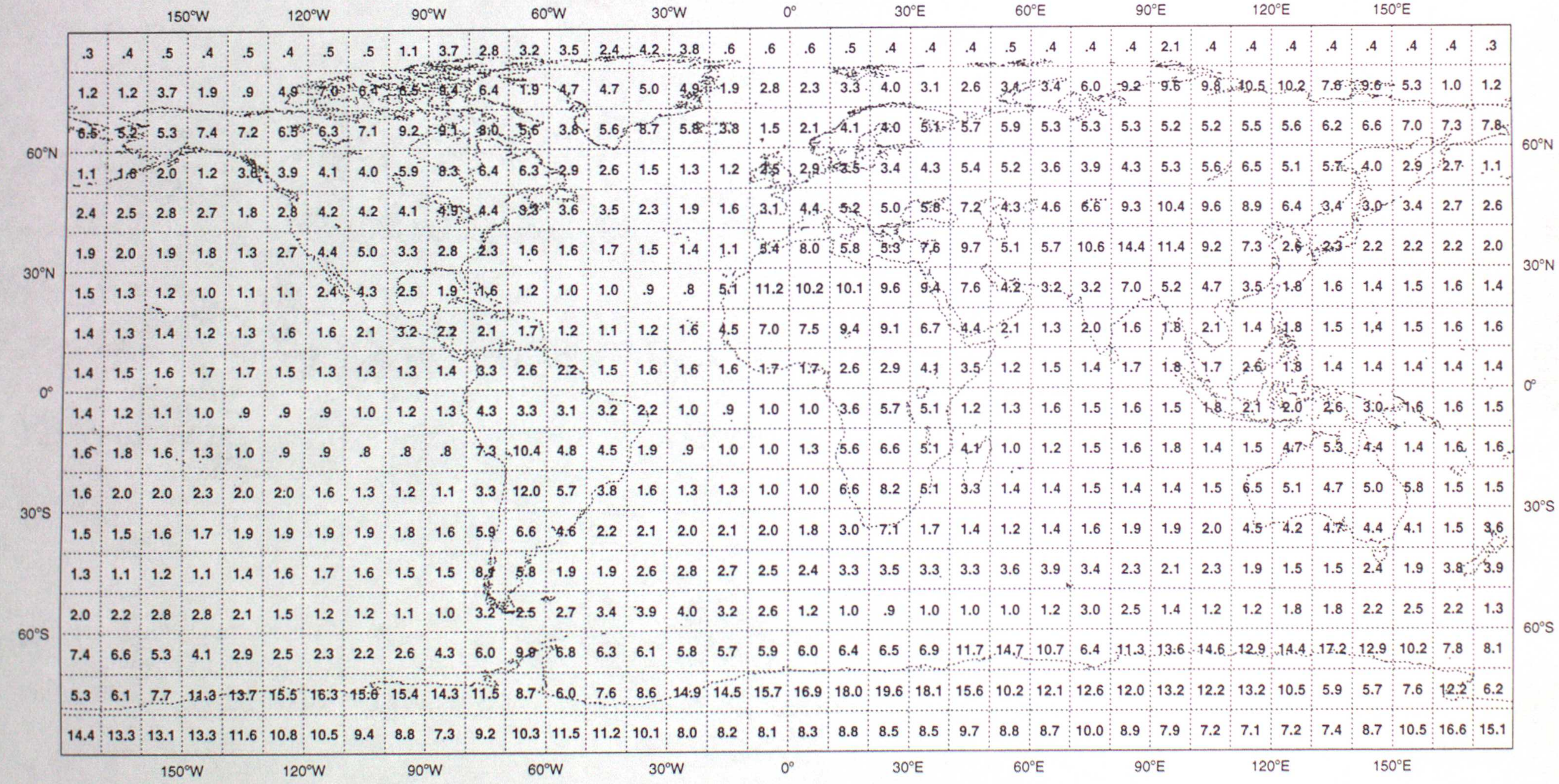
Channel: HIRS8 (Surface)

NOAA15, using all observations



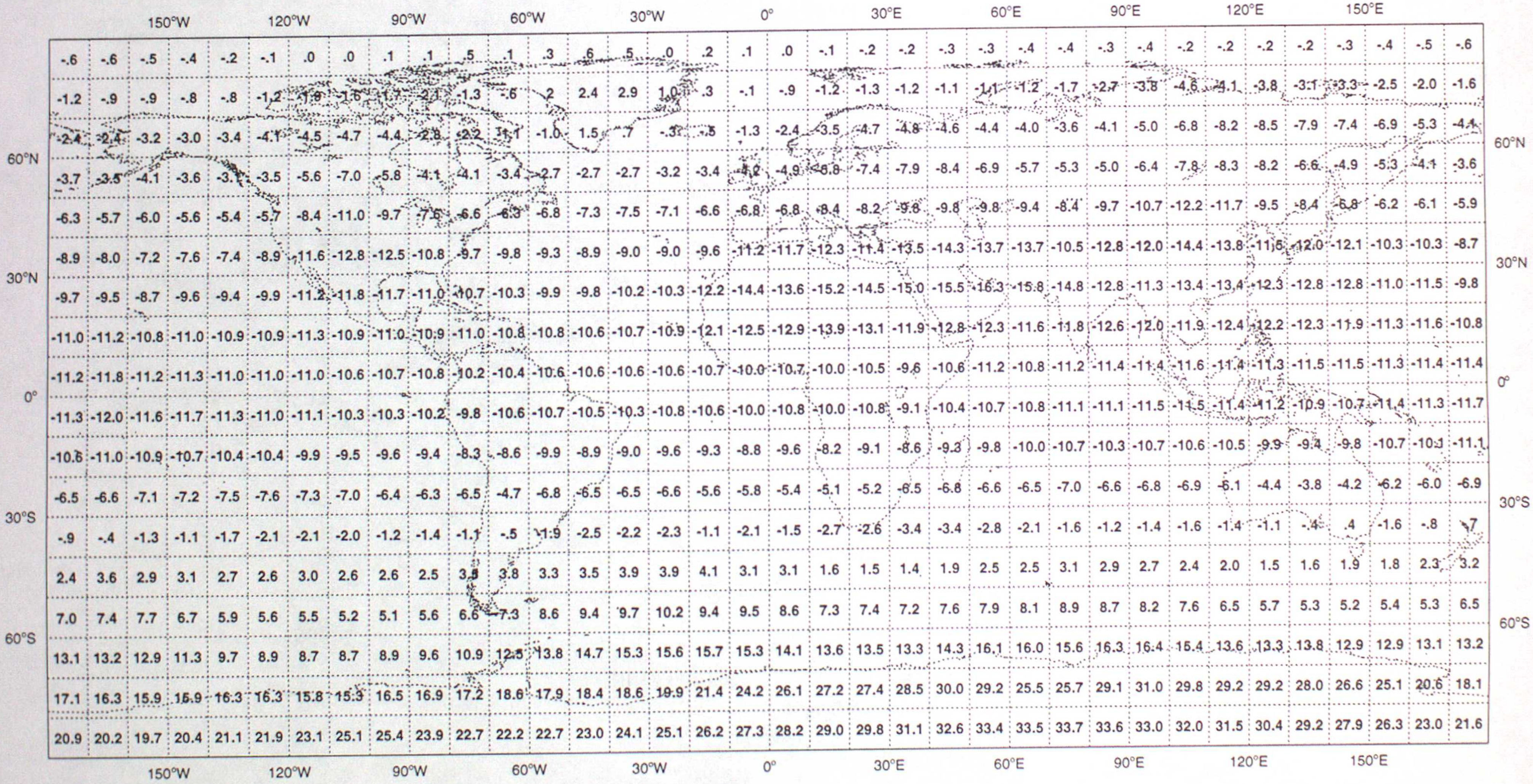
-1.6	-1.6	-1.6	-1.6	-1.7	-1.7	-1.7	-1.7	-1.6	-2.1	-.1	-2.3	-2.0	-.5	-.6	-2.5	-1.4	-1.4	-1.5	-1.6	-1.3	-1.3	-1.4	-1.4	-1.5	-1.5	-1.5	-2.1	-1.5	-1.5	-1.5	-1.5	-1.5	-1.5	-1.6	-1.6
-1.6	-1.7	-2.6	-2.0	-1.8	-3.8	-7.7	-5.9	-6.4	-9.1	-4.8	-1.8	-.1	7.7	8.4	1.0	-2.4	-4.7	-7.2	-6.7	-5.6	-4.6	-3.8	-2.8	-2.2	-4.2	-8.3	-12.3	-15.1	-11.2	-8.7	-5.2	-7.7	-3.6	-1.9	-1.7
-8.3	-9.9	-13.5	-11.4	-12.9	-15.2	-16.0	-17.2	-17.0	-10.5	-9.5	-5.2	-6.0	4.1	-1.9	-7.1	-8.6	-10.0	-11.6	-13.5	-17.2	-16.9	-14.8	-13.6	-14.1	-14.0	-15.8	-15.8	-20.6	-25.3	-24.7	-23.1	-21.8	-21.1	-18.7	-16.3
-9.2	-10.3	-11.8	-11.8	-10.3	-12.3	-16.8	-18.9	-16.4	-11.5	-14.4	-12.8	-9.2	-10.0	-12.3	-13.9	-14.4	-14.6	-16.7	-19.4	-21.9	-23.1	-23.5	-20.9	-19.6	-19.0	-17.1	-18.4	-21.2	-21.1	-19.6	-15.3	-10.3	-10.8	-9.6	-8.3
-14.0	-14.0	-14.3	-14.4	-14.4	-15.2	-19.1	-23.1	-22.3	-19.5	-19.9	-17.6	-16.2	-16.7	-18.3	-18.2	-18.1	-18.3	-19.7	-22.3	-24.1	-24.8	-23.9	-26.4	-26.3	-21.1	-22.5	-24.3	-29.9	-29.0	-22.7	-18.0	-13.7	-12.1	-12.3	-12.9
-20.9	-21.2	-21.1	-20.6	-19.4	-18.6	-24.0	-25.1	-26.6	-23.7	-23.5	-23.2	-23.4	-23.3	-22.5	-22.2	-21.9	-24.7	-28.5	-28.2	-28.4	-27.1	-28.3	-26.4	-26.6	-15.5	-19.2	-16.9	-28.9	-30.8	-23.6	-23.5	-23.6	-22.1	-21.5	-20.8
-23.8	-23.6	-23.0	-22.3	-21.3	-20.9	-22.7	-23.3	-25.9	-25.0	-25.5	-25.2	-25.1	-24.3	-23.9	-23.6	-25.6	-30.9	-29.1	-36.1	-35.0	-29.8	-30.9	-30.9	-29.5	-27.6	-16.1	-17.7	-24.2	-25.0	-25.0	-25.5	-25.4	-24.3	-24.6	-24.2
-24.2	-24.1	-23.6	-23.1	-23.0	-22.6	-22.9	-22.9	-22.9	-24.1	-25.2	-24.7	-24.9	-24.0	-23.4	-23.4	-25.6	-27.1	-27.3	-31.8	-28.2	-23.1	-24.9	-24.3	-23.5	-23.3	-23.7	-22.5	-23.6	-24.1	-23.4	-23.7	-24.2	-24.2	-24.7	-24.4
-24.0	-24.1	-23.8	-23.6	-23.2	-22.8	-22.5	-22.5	-22.2	-21.9	-19.9	-21.4	-23.0	-23.7	-23.3	-22.9	-22.4	-21.5	-21.3	-20.7	-20.7	-18.0	-22.1	-24.0	-23.7	-23.9	-23.7	-23.7	-24.2	-23.5	-24.0	-24.1	-23.7	-23.8	-23.7	-24.1
-25.6	-26.1	-26.2	-26.1	-25.4	-24.6	-23.7	-22.9	-22.1	-20.5	-19.3	-23.4	-23.1	-23.3	-23.5	-24.5	-23.9	-23.2	-22.7	-21.4	-21.2	-17.7	-23.9	-24.0	-23.9	-24.1	-23.4	-24.0	-24.5	-24.4	-24.2	-22.8	-21.3	-23.3	-24.1	-25.1
-24.6	-24.8	-24.9	-25.3	-25.2	-24.6	-23.8	-23.0	-22.2	-20.5	-15.3	-16.9	-21.8	-19.6	-23.3	-23.4	-22.7	-21.9	-21.5	-15.4	-16.5	-17.8	-21.8	-23.3	-23.6	-23.5	-22.8	-23.1	-23.9	-24.3	-21.7	-19.4	-21.0	-23.6	-22.9	-23.9
-20.6	-20.6	-20.6	-20.7	-21.3	-21.5	-21.6	-20.8	-19.6	-18.8	-17.0	-8.1	-16.4	-18.7	-21.6	-21.2	-20.4	-19.8	-19.0	-12.1	-9.4	-19.4	-20.5	-21.2	-20.7	-20.7	-20.2	-20.4	-20.8	-16.3	-8.7	-8.0	-9.9	-19.0	-20.8	-20.7
-15.9	-15.9	-15.9	-15.8	-16.0	-16.0	-16.1	-16.1	-15.6	-14.9	-11.6	-6.3	-12.5	-16.9	-16.8	-16.5	-15.5	-15.1	-15.6	-15.9	-13.8	-18.9	-18.0	-16.8	-15.9	-15.5	-15.3	-15.0	-15.6	-14.7	-13.3	-12.4	-7.8	-16.6	-17.1	-15.6
-12.5	-11.7	-11.2	-10.7	-10.3	-10.2	-10.4	-10.4	-10.1	-10.0	-4.7	-4.9	-8.9	-10.0	-8.6	-8.5	-8.0	-7.5	-7.6	-8.5	-9.1	-8.9	-8.4	-8.7	-9.3	-9.1	-9.8	-9.4	-9.1	-9.9	-10.7	-11.3	-11.4	-12.2	-11.7	-9.9
-7.7	-6.7	-5.7	-5.3	-5.6	-6.1	-6.1	-6.4	-6.4	-6.3	-5.0	-4.4	-3.0	-1.3	-.1	-.3	-.8	-.6	-1.3	-1.5	-1.7	-2.3	-2.3	-2.7	-2.5	-.6	-1.7	-2.6	-2.6	-3.3	-4.4	-4.8	-4.6	-5.6	-7.2	-8.1
4.2	5.2	5.2	2.7	.5	-.5	-1.1	-1.2	-.9	.3	2.4	6.6	9.5	12.3	12.2	11.5	11.9	10.6	7.3	6.8	6.7	6.7	10.6	16.8	15.2	12.2	14.4	14.8	13.3	10.0	10.3	14.0	10.9	10.1	8.7	6.1
15.2	13.4	12.7	14.1	16.5	18.4	19.2	17.8	23.4	24.4	23.6	26.1	19.4	20.0	19.8	26.1	30.1	39.2	44.6	47.7	47.9	52.3	59.1	55.6	42.6	42.1	52.6	60.9	58.2	58.5	57.6	53.2	51.0	45.5	26.7	16.3
27.1	25.2	24.2	29.5	32.1	33.3	36.4	43.9	46.0	39.6	34.5	31.4	33.3	35.0	39.6	44.4	47.5	51.4	53.4	55.1	55.0	57.5	63.1	66.0	65.6	67.0	66.6	65.5	62.9	61.2	57.2	53.8	50.8	45.8	32.5	27.9

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). JULY 2001
Channel: HIRS8 (Surface)
NOAA15, using all observations



.3	.4	.5	.4	.5	.4	.5	.5	1.1	3.7	2.8	3.2	3.5	2.4	4.2	3.8	.6	.6	.6	.5	.4	.4	.4	.5	.4	.4	.4	2.1	.4	.4	.4	.4	.4	.4	.4	.3
1.2	1.2	3.7	1.9	.9	4.9	7.0	6.4	6.5	8.4	6.4	1.9	4.7	4.7	5.0	4.9	1.9	2.8	2.3	3.3	4.0	3.1	2.6	3.4	3.4	6.0	9.2	9.6	9.8	10.5	10.2	7.6	9.6	5.3	1.0	1.2
6.5	5.2	5.3	7.4	7.2	6.5	6.3	7.1	9.2	9.1	8.0	5.6	3.8	5.6	8.7	5.8	3.8	1.5	2.1	4.1	4.0	5.1	5.7	5.9	5.3	5.3	5.3	5.2	5.2	5.5	5.6	6.2	6.6	7.0	7.3	7.8
1.1	1.6	2.0	1.2	3.8	3.9	4.1	4.0	5.9	8.3	6.4	6.3	2.9	2.6	1.5	1.3	1.2	2.5	2.9	3.5	3.4	4.3	5.4	5.2	3.6	3.9	4.3	5.3	5.6	6.5	5.1	5.7	4.0	2.9	2.7	1.1
2.4	2.5	2.8	2.7	1.8	2.8	4.2	4.2	4.1	4.9	4.4	3.3	3.6	3.5	2.3	1.9	1.6	3.1	4.4	5.2	5.0	5.8	7.2	4.3	4.6	6.6	9.3	10.4	9.6	8.9	6.4	3.4	3.0	3.4	2.7	2.6
1.9	2.0	1.9	1.8	1.3	2.7	4.4	5.0	3.3	2.8	2.3	1.6	1.6	1.7	1.5	1.4	1.1	5.4	8.0	5.8	5.3	7.6	9.7	5.1	5.7	10.6	14.4	11.4	9.2	7.3	2.6	2.3	2.2	2.2	2.2	2.0
1.5	1.3	1.2	1.0	1.1	1.1	2.4	4.3	2.5	1.9	1.6	1.2	1.0	1.0	.9	.8	5.1	11.2	10.2	10.1	9.6	9.4	7.6	4.2	3.2	3.2	7.0	5.2	4.7	3.5	1.8	1.6	1.4	1.5	1.6	1.4
1.4	1.3	1.4	1.2	1.3	1.6	1.6	2.1	3.2	2.2	2.1	1.7	1.2	1.1	1.2	1.6	4.5	7.0	7.5	9.4	9.1	6.7	4.4	2.1	1.3	2.0	1.6	1.8	2.1	1.4	1.8	1.5	1.4	1.5	1.6	1.6
1.4	1.5	1.6	1.7	1.7	1.5	1.3	1.3	1.3	1.4	3.3	2.6	2.2	1.5	1.6	1.6	1.6	1.7	1.7	2.6	2.9	4.1	3.5	1.2	1.5	1.4	1.7	1.8	1.7	2.6	1.8	1.4	1.4	1.4	1.4	1.4
1.4	1.2	1.1	1.0	.9	.9	.9	1.0	1.2	1.3	4.3	3.3	3.1	3.2	2.2	1.0	.9	1.0	1.0	3.6	5.7	5.1	1.2	1.3	1.6	1.5	1.6	1.5	1.8	2.1	2.0	2.6	3.0	1.6	1.6	1.5
1.6	1.8	1.6	1.3	1.0	.9	.9	.8	.8	.8	7.3	10.4	4.8	4.5	1.9	.9	1.0	1.0	1.3	5.6	6.6	5.1	4.1	1.0	1.2	1.5	1.6	1.8	1.4	1.5	4.7	5.3	4.4	1.4	1.6	1.6
1.6	2.0	2.0	2.3	2.0	2.0	1.6	1.3	1.2	1.1	3.3	12.0	5.7	3.8	1.6	1.3	1.3	1.0	1.0	6.6	8.2	5.1	3.3	1.4	1.4	1.5	1.4	1.4	1.5	6.5	5.1	4.7	5.0	5.8	1.5	1.5
1.5	1.5	1.6	1.7	1.9	1.9	1.9	1.9	1.8	1.6	5.9	6.6	4.6	2.2	2.1	2.0	2.1	2.0	1.8	3.0	7.1	1.7	1.4	1.2	1.4	1.6	1.9	1.9	2.0	4.5	4.2	4.7	4.4	4.1	1.5	3.6
1.3	1.1	1.2	1.1	1.4	1.6	1.7	1.6	1.5	1.5	8.1	5.8	1.9	1.9	2.6	2.8	2.7	2.5	2.4	3.3	3.5	3.3	3.3	3.6	3.9	3.4	2.3	2.1	2.3	1.9	1.5	1.5	2.4	1.9	3.8	3.9
2.0	2.2	2.8	2.8	2.1	1.5	1.2	1.2	1.1	1.0	3.2	2.5	2.7	3.4	3.9	4.0	3.2	2.6	1.2	1.0	.9	1.0	1.0	1.0	1.2	3.0	2.5	1.4	1.2	1.2	1.8	1.8	2.2	2.5	2.2	1.3
7.4	6.6	5.3	4.1	2.9	2.5	2.3	2.2	2.6	4.3	6.0	9.8	6.8	6.3	6.1	5.8	5.7	5.9	6.0	6.4	6.5	6.9	11.7	14.7	10.7	6.4	11.3	13.6	14.6	12.9	14.4	17.2	12.9	10.2	7.8	8.1
5.3	6.1	7.7	11.3	13.7	15.5	16.3	15.6	15.4	14.3	11.5	8.7	6.0	7.6	8.6	14.9	14.5	15.7	16.9	18.0	19.6	18.1	15.6	10.2	12.1	12.6	12.0	13.2	12.2	13.2	10.5	5.9	5.7	7.6	12.2	6.2
14.4	13.3	13.1	13.3	11.6	10.8	10.5	9.4	8.8	7.3	9.2	10.3	11.5	11.2	10.1	8.0	8.2	8.1	8.3	8.8	8.5	8.5	9.7	8.8	8.7	10.0	8.9	7.9	7.2	7.1	7.2	7.4	8.7	10.5	16.6	15.1

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2001
Channel: HIRS15 (700 hPa)
NOAA15, using all observations

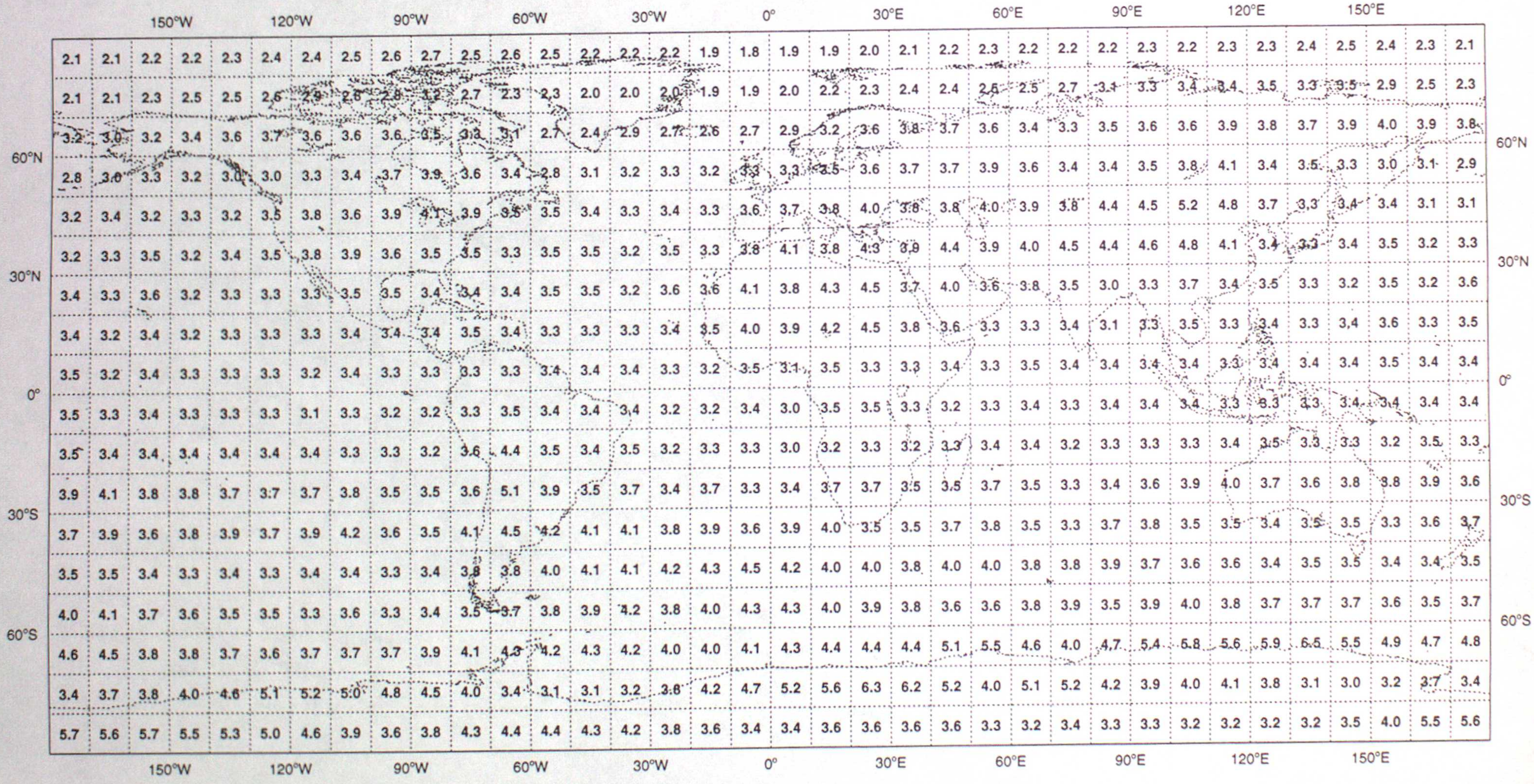


-.6	-.6	-.5	-.4	-.2	-.1	.0	.0	.1	.1	.5	.1	.3	.6	.5	.0	.2	.1	.0	-.1	-.2	-.2	-.3	-.3	-.4	-.4	-.3	-.4	-.2	-.2	-.2	-.2	-.3	-.4	-.5	-.6
-1.2	-.9	-.9	-.8	-.8	-1.2	-1.9	-1.6	-1.7	-2.1	-1.3	-.6	.2	2.4	2.9	1.0	.3	-.1	-.9	-1.2	-1.3	-1.2	-1.1	-1.1	-1.2	-1.7	-2.7	-3.8	-4.6	-4.1	-3.8	-3.1	-3.3	-2.5	-2.0	-1.6
-2.4	-2.4	-3.2	-3.0	-3.4	-4.1	-4.5	-4.7	-4.4	-2.8	-2.2	-1.1	-1.0	1.5	.7	-.3	-.5	-1.3	-2.4	-3.5	-4.7	-4.8	-4.6	-4.4	-4.0	-3.6	-4.1	-5.0	-6.8	-8.2	-8.5	-7.9	-7.4	-6.9	-5.3	-4.4
-3.7	-3.5	-4.1	-3.6	-3.1	-3.5	-5.6	-7.0	-5.8	-4.1	-4.1	-3.4	-2.7	-2.7	-2.7	-3.2	-3.4	-4.2	-4.9	-6.8	-7.4	-7.9	-8.4	-6.9	-5.7	-5.3	-5.0	-6.4	-7.8	-8.3	-8.2	-6.6	-4.9	-5.3	-4.1	-3.6
-6.3	-5.7	-6.0	-5.6	-5.4	-5.7	-8.4	-11.0	-9.7	-7.6	-6.6	-6.3	-6.8	-7.3	-7.5	-7.1	-6.6	-6.8	-6.8	-8.4	-8.2	-9.8	-9.8	-9.8	-9.4	-8.4	-9.7	-10.7	-12.2	-11.7	-9.5	-8.4	-6.8	-6.2	-6.1	-5.9
-8.9	-8.0	-7.2	-7.6	-7.4	-8.9	-11.6	-12.8	-12.5	-10.8	-9.7	-9.8	-9.3	-8.9	-9.0	-9.0	-9.6	-11.2	-11.7	-12.3	-11.4	-13.5	-14.3	-13.7	-13.7	-10.5	-12.8	-12.0	-14.4	-13.8	-11.6	-12.0	-12.1	-10.3	-10.3	-8.7
-9.7	-9.5	-8.7	-9.6	-9.4	-9.9	-11.2	-11.8	-11.7	-11.0	-10.7	-10.3	-9.9	-9.8	-10.2	-10.3	-12.2	-14.4	-13.6	-15.2	-14.5	-15.0	-15.5	-16.3	-15.8	-14.8	-12.8	-11.3	-13.4	-13.4	-12.3	-12.8	-12.8	-11.0	-11.5	-9.8
-11.0	-11.2	-10.8	-11.0	-10.9	-10.9	-11.3	-10.9	-11.0	-10.9	-11.0	-10.8	-10.8	-10.6	-10.7	-10.9	-12.1	-12.5	-12.9	-13.9	-13.1	-11.9	-12.8	-12.3	-11.6	-11.8	-12.6	-12.0	-11.9	-12.4	-12.2	-12.3	-11.9	-11.3	-11.6	-10.8
-11.2	-11.8	-11.2	-11.3	-11.0	-11.0	-11.0	-10.6	-10.7	-10.8	-10.2	-10.4	-10.6	-10.6	-10.6	-10.6	-10.7	-10.0	-10.7	-10.0	-10.5	-9.6	-10.6	-11.2	-10.8	-11.2	-11.4	-11.4	-11.6	-11.4	-11.3	-11.5	-11.5	-11.3	-11.4	-11.4
-11.3	-12.0	-11.6	-11.7	-11.3	-11.0	-11.1	-10.3	-10.3	-10.2	-9.8	-10.6	-10.7	-10.5	-10.3	-10.8	-10.6	-10.0	-10.8	-10.0	-10.8	-9.1	-10.4	-10.7	-10.8	-11.1	-11.1	-11.5	-11.5	-11.4	-11.2	-10.9	-10.7	-11.4	-11.3	-11.7
-10.6	-11.0	-10.9	-10.7	-10.4	-10.4	-9.9	-9.5	-9.6	-9.4	-8.3	-8.6	-9.9	-8.9	-9.0	-9.6	-9.3	-8.8	-9.6	-8.2	-9.1	-8.6	-9.3	-9.8	-10.0	-10.7	-10.3	-10.7	-10.6	-10.5	-9.9	-9.4	-9.8	-10.7	-10.1	-11.1
-6.5	-6.6	-7.1	-7.2	-7.5	-7.6	-7.3	-7.0	-6.4	-6.3	-6.5	-4.7	-6.8	-6.5	-6.5	-6.6	-5.6	-5.8	-5.4	-5.1	-5.2	-6.5	-6.8	-6.6	-6.5	-7.0	-6.6	-6.8	-6.9	-6.1	-4.4	-3.8	-4.2	-6.2	-6.0	-6.9
-.9	-.4	-1.3	-1.1	-1.7	-2.1	-2.1	-2.0	-1.2	-1.4	-1.1	-.5	-1.9	-2.5	-2.2	-2.3	-1.1	-2.1	-1.5	-2.7	-2.6	-3.4	-3.4	-2.8	-2.1	-1.6	-1.2	-1.4	-1.6	-1.4	-1.1	-.4	.4	-1.6	-.8	.7
2.4	3.6	2.9	3.1	2.7	2.6	3.0	2.6	2.6	2.5	3.5	3.8	3.3	3.5	3.9	3.9	4.1	3.1	3.1	1.6	1.5	1.4	1.9	2.5	2.5	3.1	2.9	2.7	2.4	2.0	1.5	1.6	1.9	1.8	2.3	3.2
7.0	7.4	7.7	6.7	5.9	5.6	5.5	5.2	5.1	5.6	6.6	7.3	8.6	9.4	9.7	10.2	9.4	9.5	8.6	7.3	7.4	7.2	7.6	7.9	8.1	8.9	8.7	8.2	7.6	6.5	5.7	5.3	5.2	5.4	5.3	6.5
13.1	13.2	12.9	11.3	9.7	8.9	8.7	8.7	8.9	9.6	10.9	12.5	13.8	14.7	15.3	15.6	15.7	15.3	14.1	13.6	13.5	13.3	14.3	16.1	16.0	15.6	16.3	16.4	15.4	13.6	13.3	13.8	12.9	12.9	13.1	13.2
17.1	16.3	15.9	15.9	16.3	16.3	15.8	15.3	16.5	16.9	17.2	18.6	17.9	18.4	18.6	19.9	21.4	24.2	26.1	27.2	27.4	28.5	30.0	29.2	25.5	25.7	29.1	31.0	29.8	29.2	29.2	28.0	26.6	25.1	20.6	18.1
20.9	20.2	19.7	20.4	21.1	21.9	23.1	25.1	25.4	23.9	22.7	22.2	22.7	23.0	24.1	25.1	26.2	27.3	28.2	29.0	29.8	31.1	32.6	33.4	33.5	33.7	33.6	33.0	32.0	31.5	30.4	29.2	27.9	26.3	23.0	21.6

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). JULY 2001

Channel: HIRS15 (700 hPa)

NOAA15, using all observations

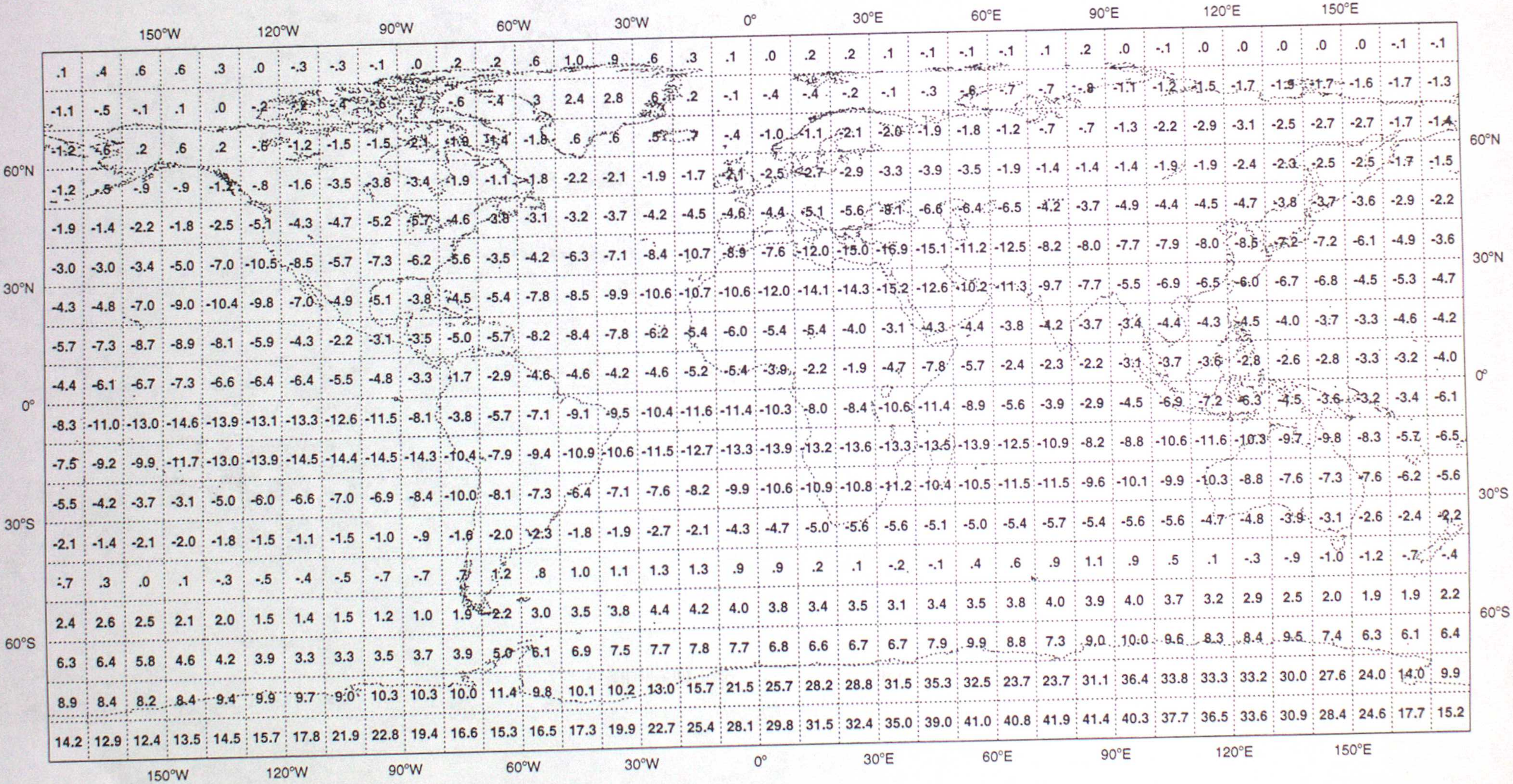


2.1	2.1	2.2	2.2	2.3	2.4	2.4	2.5	2.6	2.7	2.5	2.6	2.5	2.2	2.2	2.2	1.9	1.8	1.9	1.9	2.0	2.1	2.2	2.3	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.4	2.5	2.4	2.3	2.1
2.1	2.1	2.3	2.5	2.5	2.6	2.9	2.8	2.8	3.2	2.7	2.3	2.3	2.0	2.0	2.0	1.9	1.9	2.0	2.2	2.3	2.4	2.4	2.5	2.5	2.7	3.4	3.3	3.4	3.4	3.5	3.3	3.5	2.9	2.5	2.3
3.2	3.0	3.2	3.4	3.6	3.7	3.6	3.6	3.6	3.5	3.3	3.1	2.7	2.4	2.9	2.7	2.6	2.7	2.9	3.2	3.6	3.8	3.7	3.6	3.4	3.3	3.5	3.6	3.6	3.9	3.8	3.7	3.9	4.0	3.9	3.8
2.8	3.0	3.3	3.2	3.0	3.0	3.3	3.4	3.7	3.9	3.6	3.4	2.8	3.1	3.2	3.3	3.2	3.3	3.3	3.5	3.6	3.7	3.7	3.9	3.6	3.4	3.4	3.5	3.8	4.1	3.4	3.5	3.3	3.0	3.1	2.9
3.2	3.4	3.2	3.3	3.2	3.5	3.8	3.6	3.9	4.1	3.9	3.5	3.5	3.4	3.3	3.4	3.3	3.6	3.7	3.8	4.0	3.8	3.8	4.0	3.9	3.8	4.4	4.5	5.2	4.8	3.7	3.3	3.4	3.4	3.1	3.1
3.2	3.3	3.5	3.2	3.4	3.5	3.8	3.9	3.6	3.5	3.5	3.3	3.5	3.5	3.2	3.5	3.3	3.8	4.1	3.8	4.3	3.9	4.4	3.9	4.0	4.5	4.4	4.6	4.8	4.1	3.4	3.3	3.4	3.5	3.2	3.3
3.4	3.3	3.6	3.2	3.3	3.3	3.3	3.5	3.5	3.4	3.4	3.4	3.5	3.5	3.2	3.6	3.6	4.1	3.8	4.3	4.5	3.7	4.0	3.6	3.8	3.5	3.0	3.3	3.7	3.4	3.5	3.3	3.2	3.5	3.2	3.6
3.4	3.2	3.4	3.2	3.3	3.3	3.3	3.4	3.4	3.4	3.5	3.4	3.3	3.3	3.3	3.4	3.5	4.0	3.9	4.2	4.5	3.8	3.6	3.3	3.3	3.4	3.1	3.3	3.5	3.3	3.4	3.3	3.4	3.6	3.3	3.5
3.5	3.2	3.4	3.3	3.3	3.3	3.2	3.4	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.3	3.2	3.5	3.1	3.5	3.3	3.3	3.4	3.3	3.5	3.4	3.4	3.4	3.4	3.3	3.4	3.4	3.4	3.5	3.4	3.4
3.5	3.3	3.4	3.3	3.3	3.3	3.1	3.3	3.2	3.2	3.3	3.5	3.4	3.4	3.4	3.2	3.2	3.4	3.0	3.5	3.5	3.3	3.2	3.3	3.4	3.3	3.4	3.4	3.4	3.3	3.3	3.3	3.4	3.4	3.4	3.4
3.5	3.4	3.4	3.4	3.4	3.4	3.4	3.3	3.3	3.2	3.6	4.4	3.5	3.4	3.5	3.2	3.3	3.3	3.0	3.2	3.3	3.2	3.3	3.4	3.4	3.2	3.3	3.3	3.3	3.4	3.5	3.3	3.3	3.2	3.5	3.3
3.9	4.1	3.8	3.8	3.7	3.7	3.7	3.8	3.5	3.5	3.6	5.1	3.9	3.5	3.7	3.4	3.7	3.3	3.4	3.7	3.7	3.5	3.5	3.7	3.5	3.3	3.4	3.6	3.9	4.0	3.7	3.6	3.8	3.8	3.9	3.6
3.7	3.9	3.6	3.8	3.9	3.7	3.9	4.2	3.6	3.5	4.1	4.5	4.2	4.1	4.1	3.8	3.9	3.6	3.9	4.0	3.5	3.5	3.7	3.8	3.5	3.3	3.7	3.8	3.5	3.5	3.4	3.5	3.5	3.3	3.6	3.7
3.5	3.5	3.4	3.3	3.4	3.3	3.4	3.4	3.3	3.4	3.8	3.8	4.0	4.1	4.1	4.2	4.3	4.5	4.2	4.0	4.0	3.8	4.0	4.0	3.8	3.8	3.9	3.7	3.6	3.6	3.4	3.5	3.5	3.4	3.4	3.5
4.0	4.1	3.7	3.6	3.5	3.5	3.3	3.6	3.3	3.4	3.5	3.7	3.8	3.9	4.2	3.8	4.0	4.3	4.3	4.0	3.9	3.8	3.6	3.6	3.8	3.9	3.5	3.9	4.0	3.8	3.7	3.7	3.7	3.6	3.5	3.7
4.6	4.5	3.8	3.8	3.7	3.6	3.7	3.7	3.7	3.9	4.1	4.3	4.2	4.3	4.2	4.0	4.0	4.1	4.3	4.4	4.4	4.4	5.1	5.5	4.6	4.0	4.7	5.4	5.8	5.6	5.9	6.5	5.5	4.9	4.7	4.8
3.4	3.7	3.8	4.0	4.6	5.1	5.2	5.0	4.8	4.5	4.0	3.4	3.1	3.1	3.2	3.8	4.2	4.7	5.2	5.6	6.3	6.2	5.2	4.0	5.1	5.2	4.2	3.9	4.0	4.1	3.8	3.1	3.0	3.2	3.7	3.4
5.7	5.6	5.7	5.5	5.3	5.0	4.6	3.9	3.6	3.8	4.3	4.4	4.4	4.3	4.2	3.8	3.6	3.4	3.4	3.6	3.6	3.6	3.6	3.3	3.2	3.4	3.3	3.3	3.2	3.2	3.2	3.2	3.5	4.0	5.5	5.6

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2001

Channel: HIRS11 (500 - 700 hPa)

NOAA15, using all observations

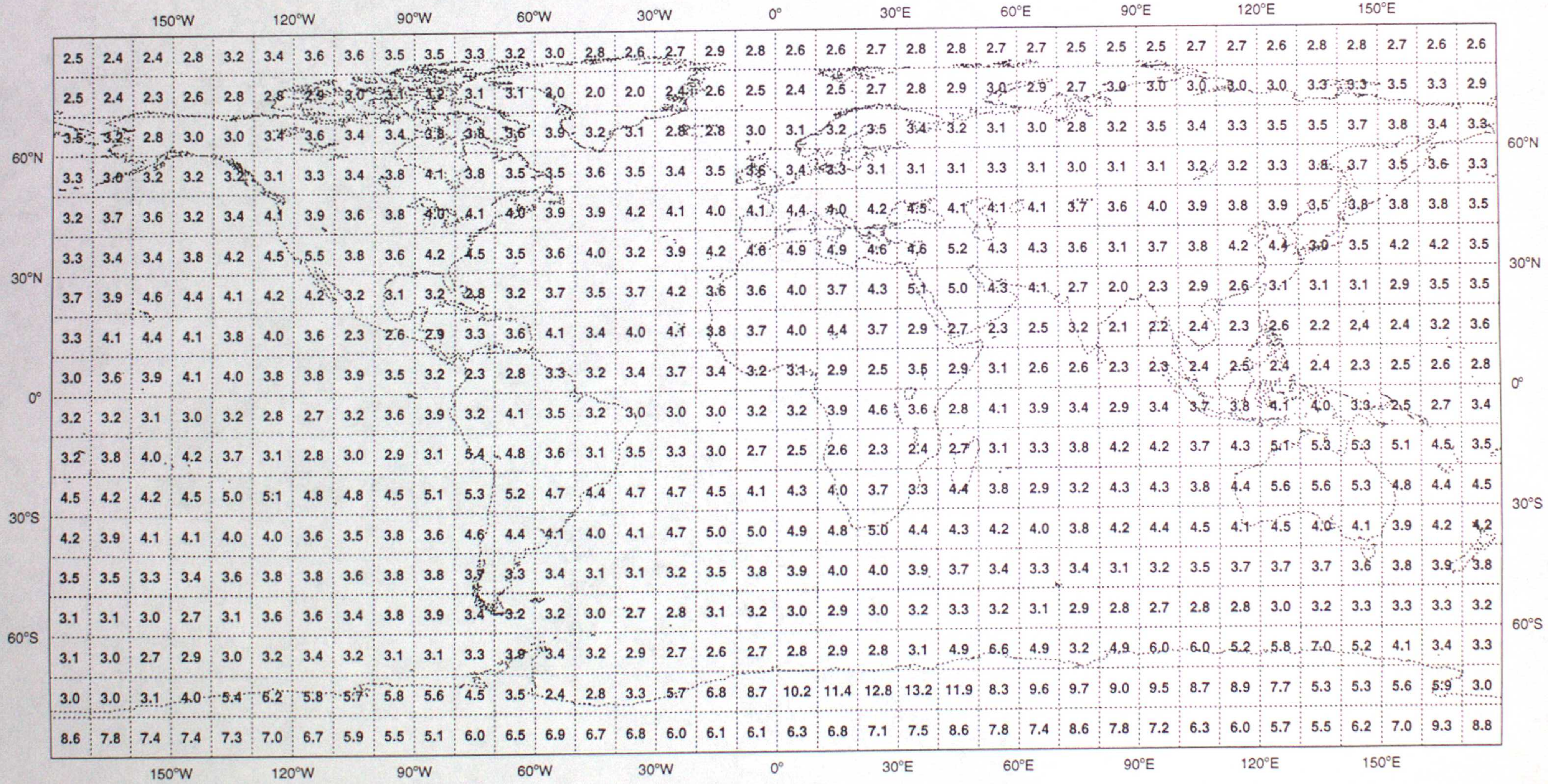


.1	.4	.6	.6	.3	.0	-.3	-.3	-.1	.0	.2	.2	.6	1.0	.9	.6	.3	.1	.0	.2	.2	.1	-.1	-.1	-.1	.1	.2	.0	-.1	.0	.0	.0	.0	.0	-.1	-.1
-1.1	-.5	-.1	.1	.0	-.2	-.2	-.4	-.6	-.7	-.6	-.4	.3	2.4	2.8	.6	.2	-.1	-.4	-.4	-.2	-.1	-.3	-.6	-.7	-.7	-.8	-1.1	-1.2	-1.5	-1.7	-1.9	-1.7	-1.6	-1.7	-1.3
-1.2	-.6	.2	.6	.2	-.6	-1.2	-1.5	-1.5	-2.1	-1.9	-1.4	-1.8	.6	.6	.5	-.7	-.4	-1.0	-1.1	-2.1	-2.0	-1.9	-1.8	-1.2	-.7	-.7	-1.3	-2.2	-2.9	-3.1	-2.5	-2.7	-2.7	-1.7	-1.4
-1.2	-.5	-.9	-.9	-1.2	-.8	-1.6	-3.5	-3.8	-3.4	-1.9	-1.1	-1.8	-2.2	-2.1	-1.9	-1.7	-2.1	-2.5	-2.7	-2.9	-3.3	-3.9	-3.5	-1.9	-1.4	-1.4	-1.4	-1.9	-1.9	-2.4	-2.3	-2.5	-2.5	-1.7	-1.5
-1.9	-1.4	-2.2	-1.8	-2.5	-5.1	-4.3	-4.7	-5.2	-5.7	-4.6	-3.8	-3.1	-3.2	-3.7	-4.2	-4.5	-4.6	-4.4	-5.1	-5.6	-8.1	-6.6	-6.4	-6.5	-4.2	-3.7	-4.9	-4.4	-4.5	-4.7	-3.8	-3.7	-3.6	-2.9	-2.2
-3.0	-3.0	-3.4	-5.0	-7.0	-10.5	-8.5	-5.7	-7.3	-6.2	-5.6	-3.5	-4.2	-6.3	-7.1	-8.4	-10.7	-8.9	-7.6	-12.0	-15.0	-16.9	-15.1	-11.2	-12.5	-8.2	-8.0	-7.7	-7.9	-8.0	-8.5	-7.2	-7.2	-6.1	-4.9	-3.6
-4.3	-4.8	-7.0	-9.0	-10.4	-9.8	-7.0	-4.9	-5.1	-3.8	-4.5	-5.4	-7.8	-8.5	-9.9	-10.6	-10.7	-10.6	-12.0	-14.1	-14.3	-15.2	-12.6	-10.2	-11.3	-9.7	-7.7	-5.5	-6.9	-6.5	-6.0	-6.7	-6.8	-4.5	-5.3	-4.7
-5.7	-7.3	-8.7	-8.9	-8.1	-5.9	-4.3	-2.2	-3.1	-3.5	-5.0	-5.7	-8.2	-8.4	-7.8	-6.2	-5.4	-6.0	-5.4	-5.4	-4.0	-3.1	-4.3	-4.4	-3.8	-4.2	-3.7	-3.4	-4.4	-4.3	-4.5	-4.0	-3.7	-3.3	-4.6	-4.2
-4.4	-6.1	-6.7	-7.3	-6.6	-6.4	-6.4	-5.5	-4.8	-3.3	-1.7	-2.9	-4.6	-4.6	-4.2	-4.6	-5.2	-5.4	-3.9	-2.2	-1.9	-4.7	-7.8	-5.7	-2.4	-2.3	-2.2	-3.1	-3.7	-3.6	-2.8	-2.6	-2.8	-3.3	-3.2	-4.0
-8.3	-11.0	-13.0	-14.6	-13.9	-13.1	-13.3	-12.6	-11.5	-8.1	-3.8	-5.7	-7.1	-9.1	-9.5	-10.4	-11.6	-11.4	-10.3	-8.0	-8.4	-10.6	-11.4	-8.9	-5.6	-3.9	-2.9	-4.5	-6.9	-7.2	-6.3	-4.5	-3.6	-3.2	-3.4	-6.1
-7.5	-9.2	-9.9	-11.7	-13.0	-13.9	-14.5	-14.4	-14.5	-14.3	-10.4	-7.9	-9.4	-10.9	-10.6	-11.5	-12.7	-13.3	-13.9	-13.2	-13.6	-13.3	-13.5	-13.9	-12.5	-10.9	-8.2	-8.8	-10.6	-11.6	-10.3	-9.7	-9.8	-8.3	-5.7	-6.5
-5.5	-4.2	-3.7	-3.1	-5.0	-6.0	-6.6	-7.0	-6.9	-8.4	-10.0	-8.1	-7.3	-6.4	-7.1	-7.6	-8.2	-9.9	-10.6	-10.9	-10.8	-11.2	-10.4	-10.5	-11.5	-11.5	-9.6	-10.1	-9.9	-10.3	-8.8	-7.6	-7.3	-7.6	-6.2	-5.6
-2.1	-1.4	-2.1	-2.0	-1.8	-1.5	-1.1	-1.5	-1.0	-.9	-1.6	-2.0	-2.3	-1.8	-1.9	-2.7	-2.1	-4.3	-4.7	-5.0	-5.6	-5.6	-5.1	-5.0	-5.4	-5.7	-5.4	-5.6	-5.6	-4.7	-4.8	-3.9	-3.1	-2.6	-2.4	-2.2
-.7	.3	.0	.1	-.3	-.5	-.4	-.5	-.7	-.7	.7	1.2	.8	1.0	1.1	1.3	1.3	.9	.9	.2	.1	-.2	-.1	.4	.6	.9	1.1	.9	.5	.1	-.3	-.9	-1.0	-1.2	-.7	-.4
2.4	2.6	2.5	2.1	2.0	1.5	1.4	1.5	1.2	1.0	1.9	2.2	3.0	3.5	3.8	4.4	4.2	4.0	3.8	3.4	3.5	3.1	3.4	3.5	3.8	4.0	3.9	4.0	3.7	3.2	2.9	2.5	2.0	1.9	1.9	2.2
6.3	6.4	5.8	4.6	4.2	3.9	3.3	3.3	3.5	3.7	3.9	5.0	6.1	6.9	7.5	7.7	7.8	7.7	6.8	6.6	6.7	6.7	7.9	9.9	8.8	7.3	9.0	10.0	9.6	8.3	8.4	9.5	7.4	6.3	6.1	6.4
8.9	8.4	8.2	8.4	9.4	9.9	9.7	9.0	10.3	10.3	10.0	11.4	9.8	10.1	10.2	13.0	15.7	21.5	25.7	28.2	28.8	31.5	35.3	32.5	23.7	23.7	31.1	36.4	33.8	33.3	33.2	30.0	27.6	24.0	14.0	9.9
14.2	12.9	12.4	13.5	14.5	15.7	17.8	21.9	22.8	19.4	16.6	15.3	16.5	17.3	19.9	22.7	25.4	28.1	29.8	31.5	32.4	35.0	39.0	41.0	40.8	41.9	41.4	40.3	37.7	36.5	33.6	30.9	28.4	24.6	17.7	15.2

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). JULY 2001

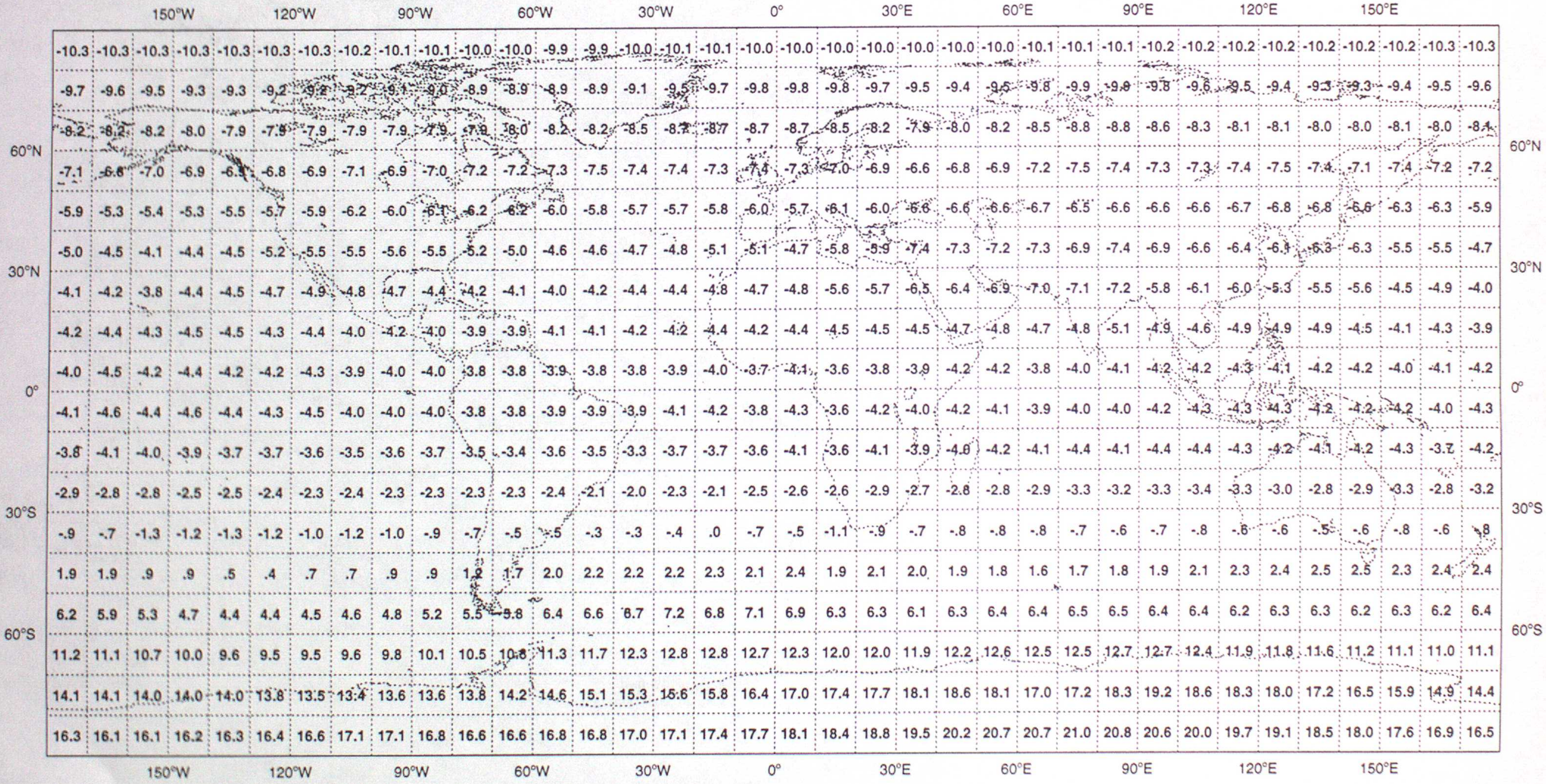
Channel: HIRS11 (500 - 700 hPa)

NOAA15, using all observations



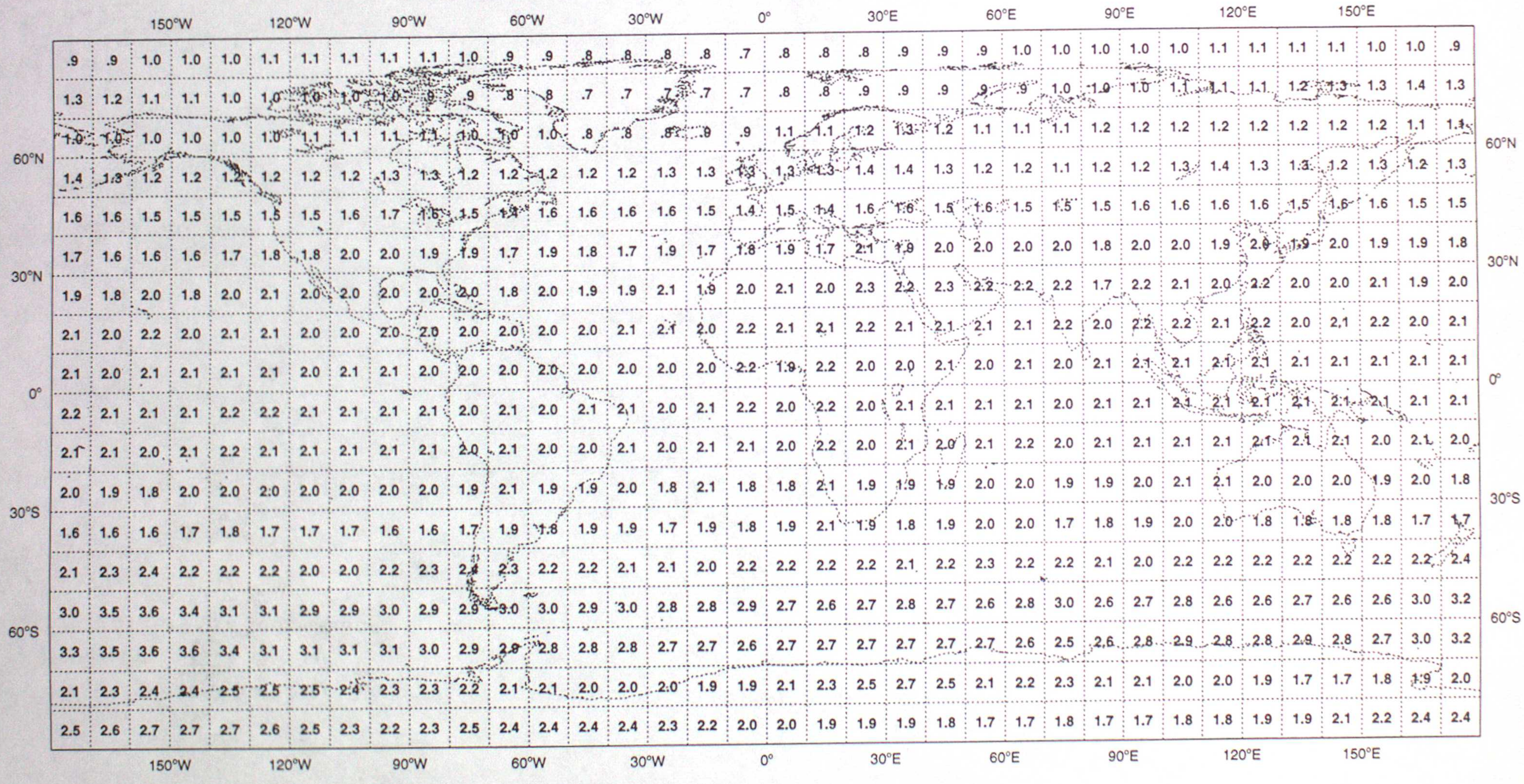
2.5	2.4	2.4	2.8	3.2	3.4	3.6	3.6	3.5	3.5	3.3	3.2	3.0	2.8	2.6	2.7	2.9	2.8	2.6	2.6	2.7	2.8	2.8	2.7	2.7	2.5	2.5	2.5	2.7	2.7	2.6	2.8	2.8	2.7	2.6	2.6
2.5	2.4	2.3	2.6	2.8	2.8	2.9	3.0	3.1	3.2	3.1	3.1	3.0	2.0	2.0	2.4	2.6	2.5	2.4	2.5	2.7	2.8	2.9	3.0	2.9	2.7	3.0	3.0	3.0	3.0	3.0	3.3	3.3	3.5	3.3	2.9
3.5	3.2	2.8	3.0	3.0	3.4	3.6	3.4	3.4	3.8	3.8	3.6	3.9	3.2	3.1	2.8	2.8	3.0	3.1	3.2	3.5	3.4	3.2	3.1	3.0	2.8	3.2	3.5	3.4	3.3	3.5	3.5	3.7	3.8	3.4	3.3
3.3	3.0	3.2	3.2	3.2	3.1	3.3	3.4	3.8	4.1	3.8	3.5	3.5	3.6	3.5	3.4	3.5	3.6	3.4	3.3	3.1	3.1	3.1	3.3	3.1	3.0	3.1	3.1	3.2	3.2	3.3	3.8	3.7	3.5	3.6	3.3
3.2	3.7	3.6	3.2	3.4	4.1	3.9	3.6	3.8	4.0	4.1	4.0	3.9	3.9	4.2	4.1	4.0	4.1	4.4	4.0	4.2	4.5	4.1	4.1	4.1	3.7	3.6	4.0	3.9	3.8	3.9	3.5	3.8	3.8	3.8	3.5
3.3	3.4	3.4	3.8	4.2	4.5	5.5	3.8	3.6	4.2	4.5	3.5	3.6	4.0	3.2	3.9	4.2	4.6	4.9	4.9	4.6	4.6	5.2	4.3	4.3	3.6	3.1	3.7	3.8	4.2	4.4	3.0	3.5	4.2	4.2	3.5
3.7	3.9	4.6	4.4	4.1	4.2	4.2	3.2	3.1	3.2	2.8	3.2	3.7	3.5	3.7	4.2	3.6	3.6	4.0	3.7	4.3	5.1	5.0	4.3	4.1	2.7	2.0	2.3	2.9	2.6	3.1	3.1	3.1	2.9	3.5	3.5
3.3	4.1	4.4	4.1	3.8	4.0	3.6	2.3	2.6	2.9	3.3	3.6	4.1	3.4	4.0	4.1	3.8	3.7	4.0	4.4	3.7	2.9	2.7	2.3	2.5	3.2	2.1	2.2	2.4	2.3	2.6	2.2	2.4	2.4	3.2	3.6
3.0	3.6	3.9	4.1	4.0	3.8	3.8	3.9	3.5	3.2	2.3	2.8	3.3	3.2	3.4	3.7	3.4	3.2	3.1	2.9	2.5	3.5	2.9	3.1	2.6	2.6	2.3	2.3	2.4	2.5	2.4	2.4	2.3	2.5	2.6	2.8
3.2	3.2	3.1	3.0	3.2	2.8	2.7	3.2	3.6	3.9	3.2	4.1	3.5	3.2	3.0	3.0	3.0	3.2	3.2	3.9	4.6	3.6	2.8	4.1	3.9	3.4	2.9	3.4	3.7	3.8	4.1	4.0	3.3	2.5	2.7	3.4
3.2	3.8	4.0	4.2	3.7	3.1	2.8	3.0	2.9	3.1	5.4	4.8	3.6	3.1	3.5	3.3	3.0	2.7	2.5	2.6	2.3	2.4	2.7	3.1	3.3	3.8	4.2	4.2	3.7	4.3	5.1	5.3	5.3	5.1	4.5	3.5
4.5	4.2	4.2	4.5	5.0	5.1	4.8	4.8	4.5	5.1	5.3	5.2	4.7	4.4	4.7	4.7	4.5	4.1	4.3	4.0	3.7	3.3	4.4	3.8	2.9	3.2	4.3	4.3	3.8	4.4	5.6	5.6	5.3	4.8	4.4	4.5
4.2	3.9	4.1	4.1	4.0	4.0	3.6	3.5	3.8	3.6	4.6	4.4	4.1	4.0	4.1	4.7	5.0	5.0	4.9	4.8	5.0	4.4	4.3	4.2	4.0	3.8	4.2	4.4	4.5	4.1	4.5	4.0	4.1	3.9	4.2	4.2
3.5	3.5	3.3	3.4	3.6	3.8	3.8	3.6	3.8	3.8	3.7	3.3	3.4	3.1	3.1	3.2	3.5	3.8	3.9	4.0	4.0	3.9	3.7	3.4	3.3	3.4	3.1	3.2	3.5	3.7	3.7	3.7	3.6	3.8	3.9	3.8
3.1	3.1	3.0	2.7	3.1	3.6	3.6	3.4	3.8	3.9	3.4	3.2	3.2	3.0	2.7	2.8	3.1	3.2	3.0	2.9	3.0	3.2	3.3	3.2	3.1	2.9	2.8	2.7	2.8	2.8	3.0	3.2	3.3	3.3	3.3	3.2
3.1	3.0	2.7	2.9	3.0	3.2	3.4	3.2	3.1	3.1	3.3	3.9	3.4	3.2	2.9	2.7	2.6	2.7	2.8	2.9	2.8	3.1	4.9	6.6	4.9	3.2	4.9	6.0	6.0	5.2	5.8	7.0	5.2	4.1	3.4	3.3
3.0	3.0	3.1	4.0	5.4	6.2	5.8	5.7	5.8	5.6	4.5	3.5	2.4	2.8	3.3	5.7	6.8	8.7	10.2	11.4	12.8	13.2	11.9	8.3	9.6	9.7	9.0	9.5	8.7	8.9	7.7	5.3	5.3	5.6	5.9	3.0
8.6	7.8	7.4	7.4	7.3	7.0	6.7	5.9	5.5	5.1	6.0	6.5	6.9	6.7	6.8	6.0	6.1	6.1	6.3	6.8	7.1	7.5	8.6	7.8	7.4	8.6	7.8	7.2	6.3	6.0	5.7	5.5	6.2	7.0	9.3	8.8

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2001
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



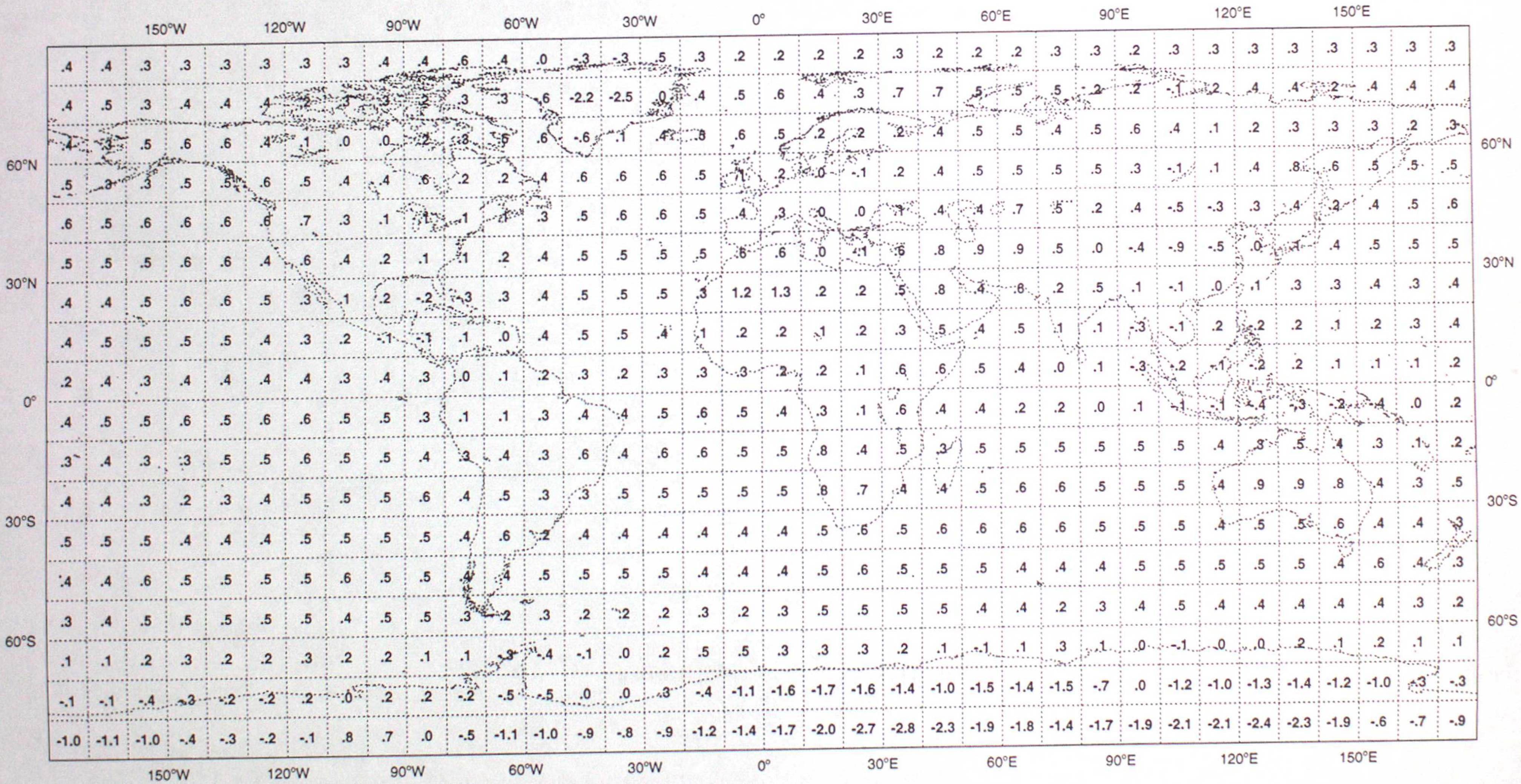
-10.3	-10.3	-10.3	-10.3	-10.3	-10.3	-10.3	-10.2	-10.1	-10.1	-10.0	-10.0	-9.9	-9.9	-10.0	-10.1	-10.1	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.1	-10.1	-10.1	-10.2	-10.2	-10.2	-10.2	-10.2	-10.2	-10.2	-10.3	-10.3
-9.7	-9.6	-9.5	-9.3	-9.3	-9.2	-9.2	-9.2	-9.1	-9.0	-8.9	-8.9	-8.9	-8.9	-9.1	-9.5	-9.7	-9.8	-9.8	-9.8	-9.7	-9.5	-9.4	-9.5	-9.8	-9.9	-9.8	-9.8	-9.6	-9.5	-9.4	-9.3	-9.3	-9.4	-9.5	-9.6
-8.2	-8.2	-8.2	-8.0	-7.9	-7.9	-7.9	-7.9	-7.9	-7.9	-7.9	-8.0	-8.2	-8.2	-8.5	-8.7	-8.7	-8.7	-8.7	-8.5	-8.2	-7.9	-8.0	-8.2	-8.5	-8.8	-8.8	-8.6	-8.3	-8.1	-8.1	-8.0	-8.0	-8.1	-8.0	-8.1
-7.1	-6.8	-7.0	-6.9	-6.9	-6.8	-6.9	-7.1	-6.9	-7.0	-7.2	-7.2	-7.3	-7.5	-7.4	-7.4	-7.3	-7.4	-7.3	-7.0	-6.9	-6.6	-6.8	-6.9	-7.2	-7.5	-7.4	-7.3	-7.3	-7.4	-7.5	-7.4	-7.1	-7.4	-7.2	-7.2
-5.9	-5.3	-5.4	-5.3	-5.5	-5.7	-5.9	-6.2	-6.0	-6.1	-6.2	-6.2	-6.0	-5.8	-5.7	-5.7	-5.8	-6.0	-5.7	-6.1	-6.0	-6.6	-6.6	-6.6	-6.7	-6.5	-6.6	-6.6	-6.6	-6.7	-6.8	-6.8	-6.6	-6.3	-6.3	-5.9
-5.0	-4.5	-4.1	-4.4	-4.5	-5.2	-5.5	-5.5	-5.6	-5.5	-5.2	-5.0	-4.6	-4.6	-4.7	-4.8	-5.1	-5.1	-4.7	-5.8	-5.9	-7.4	-7.3	-7.2	-7.3	-6.9	-7.4	-6.9	-6.6	-6.4	-6.1	-6.3	-6.3	-5.5	-5.5	-4.7
-4.1	-4.2	-3.8	-4.4	-4.5	-4.7	-4.9	-4.8	-4.7	-4.4	-4.2	-4.1	-4.0	-4.2	-4.4	-4.4	-4.8	-4.7	-4.8	-5.6	-5.7	-6.5	-6.4	-6.9	-7.0	-7.1	-7.2	-5.8	-6.1	-6.0	-5.3	-5.5	-5.6	-4.5	-4.9	-4.0
-4.2	-4.4	-4.3	-4.5	-4.5	-4.3	-4.4	-4.0	-4.2	-4.0	-3.9	-3.9	-4.1	-4.1	-4.2	-4.2	-4.4	-4.2	-4.4	-4.5	-4.5	-4.5	-4.7	-4.8	-4.7	-4.8	-5.1	-4.9	-4.6	-4.9	-4.9	-4.9	-4.5	-4.1	-4.3	-3.9
-4.0	-4.5	-4.2	-4.4	-4.2	-4.2	-4.3	-3.9	-4.0	-4.0	-3.8	-3.8	-3.9	-3.8	-3.8	-3.9	-4.0	-3.7	-4.1	-3.6	-3.8	-3.9	-4.2	-4.2	-3.8	-4.0	-4.1	-4.2	-4.2	-4.3	-4.1	-4.2	-4.2	-4.0	-4.1	-4.2
-4.1	-4.6	-4.4	-4.6	-4.4	-4.3	-4.5	-4.0	-4.0	-4.0	-3.8	-3.8	-3.9	-3.9	-3.9	-4.1	-4.2	-3.8	-4.3	-3.6	-4.2	-4.0	-4.2	-4.1	-3.9	-4.0	-4.0	-4.2	-4.3	-4.3	-4.3	-4.2	-4.2	-4.2	-4.0	-4.3
-3.8	-4.1	-4.0	-3.9	-3.7	-3.7	-3.6	-3.5	-3.6	-3.7	-3.5	-3.4	-3.6	-3.5	-3.3	-3.7	-3.7	-3.6	-4.1	-3.6	-4.1	-3.9	-4.0	-4.2	-4.1	-4.4	-4.1	-4.4	-4.4	-4.3	-4.2	-4.1	-4.2	-4.3	-3.7	-4.2
-2.9	-2.8	-2.8	-2.5	-2.5	-2.4	-2.3	-2.4	-2.3	-2.3	-2.3	-2.3	-2.4	-2.1	-2.0	-2.3	-2.1	-2.5	-2.6	-2.6	-2.9	-2.7	-2.8	-2.8	-2.9	-3.3	-3.2	-3.3	-3.4	-3.3	-3.0	-2.8	-2.9	-3.3	-2.8	-3.2
-.9	-.7	-1.3	-1.2	-1.3	-1.2	-1.0	-1.2	-1.0	-.9	-.7	-.5	-.5	-.3	-.3	-.4	.0	-.7	-.5	-1.1	-.9	-.7	-.8	-.8	-.8	-.7	-.6	-.7	-.8	-.6	-.6	-.5	-.6	-.8	-.6	-.8
1.9	1.9	.9	.9	.5	.4	.7	.7	.9	.9	1.2	1.7	2.0	2.2	2.2	2.2	2.3	2.1	2.4	1.9	2.1	2.0	1.9	1.8	1.6	1.7	1.8	1.9	2.1	2.3	2.4	2.5	2.5	2.3	2.4	2.4
6.2	5.9	5.3	4.7	4.4	4.4	4.5	4.6	4.8	5.2	5.5	5.8	6.4	6.6	6.7	7.2	6.8	7.1	6.9	6.3	6.3	6.1	6.3	6.4	6.4	6.5	6.5	6.4	6.4	6.2	6.3	6.3	6.2	6.3	6.2	6.4
11.2	11.1	10.7	10.0	9.6	9.5	9.5	9.6	9.8	10.1	10.5	10.8	11.3	11.7	12.3	12.8	12.8	12.7	12.3	12.0	12.0	11.9	12.2	12.6	12.5	12.5	12.7	12.7	12.4	11.9	11.8	11.6	11.2	11.1	11.0	11.1
14.1	14.1	14.0	14.0	14.0	13.8	13.5	13.4	13.6	13.6	13.8	14.2	14.6	15.1	15.3	15.6	15.8	16.4	17.0	17.4	17.7	18.1	18.6	18.1	17.0	17.2	18.3	19.2	18.6	18.3	18.0	17.2	16.5	15.9	14.9	14.4
16.3	16.1	16.1	16.2	16.3	16.4	16.6	17.1	17.1	16.8	16.6	16.6	16.8	16.8	17.0	17.1	17.4	17.7	18.1	18.4	18.8	19.5	20.2	20.7	20.7	21.0	20.8	20.6	20.0	19.7	19.1	18.5	18.0	17.6	16.9	16.5

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). JULY 2001
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



.9	.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.0	.9	.9	.8	.8	.8	.8	.7	.8	.8	.8	.9	.9	.9	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.0	1.0	.9
1.3	1.2	1.1	1.1	1.0	1.0	1.0	1.0	1.0	.9	.9	.8	.8	.7	.7	.7	.7	.7	.8	.8	.9	.9	.9	.9	.9	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.3	1.3	1.4	1.3
1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.0	1.0	1.0	.8	.8	.8	.9	.9	1.1	1.1	1.2	1.3	1.2	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1
1.4	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.3	1.2	1.2	1.1	1.2	1.2	1.3	1.4	1.3	1.3	1.2	1.3	1.2	1.3
1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.6	1.7	1.6	1.5	1.4	1.6	1.6	1.6	1.6	1.5	1.4	1.5	1.4	1.6	1.6	1.5	1.6	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.5	1.6	1.6	1.5	1.5
1.7	1.6	1.6	1.6	1.7	1.8	1.8	2.0	2.0	1.9	1.9	1.7	1.9	1.8	1.7	1.9	1.7	1.8	1.9	1.7	2.1	1.9	2.0	2.0	2.0	2.0	1.8	2.0	2.0	1.9	2.0	1.9	2.0	1.9	1.9	1.8
1.9	1.8	2.0	1.8	2.0	2.1	2.0	2.0	2.0	2.0	2.0	1.8	2.0	1.9	1.9	2.1	1.9	2.0	2.1	2.0	2.3	2.2	2.3	2.2	2.2	2.2	1.7	2.2	2.1	2.0	2.2	2.0	2.0	2.1	1.9	2.0
2.1	2.0	2.2	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.0	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.0	2.2	2.2	2.1	2.2	2.0	2.1	2.2	2.0	2.1
2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	1.9	2.2	2.0	2.0	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
2.2	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.1	2.0	2.1	2.2	2.0	2.2	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
2.1	2.1	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.1	2.0	2.1	2.1	2.0	2.2	2.0	2.1	2.0	2.1	2.2	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.0
2.0	1.9	1.8	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	2.1	1.9	1.9	2.0	1.8	2.1	1.8	1.8	2.1	1.9	1.9	1.9	2.0	2.0	1.9	1.9	2.0	2.1	2.1	2.0	2.0	2.0	1.9	2.0	1.8
1.6	1.6	1.6	1.7	1.8	1.7	1.7	1.7	1.6	1.6	1.7	1.9	1.8	1.9	1.9	1.7	1.9	1.8	1.9	2.1	1.9	1.8	1.9	2.0	2.0	1.7	1.8	1.9	2.0	2.0	1.8	1.8	1.8	1.8	1.7	1.7
2.1	2.3	2.4	2.2	2.2	2.2	2.0	2.0	2.2	2.3	2.4	2.3	2.2	2.2	2.1	2.1	2.0	2.2	2.2	2.2	2.2	2.1	2.2	2.3	2.2	2.2	2.1	2.0	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.4
3.0	3.5	3.6	3.4	3.1	3.1	2.9	2.9	3.0	2.9	2.9	3.0	3.0	2.9	3.0	2.8	2.8	2.9	2.7	2.6	2.7	2.8	2.7	2.6	2.8	3.0	2.6	2.7	2.8	2.6	2.6	2.7	2.6	2.6	3.0	3.2
3.3	3.5	3.6	3.6	3.4	3.1	3.1	3.1	3.1	3.0	2.9	2.8	2.8	2.8	2.8	2.7	2.7	2.6	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.5	2.6	2.8	2.9	2.8	2.8	2.9	2.8	2.7	3.0	3.2
2.1	2.3	2.4	2.4	2.5	2.5	2.5	2.4	2.3	2.3	2.2	2.1	2.1	2.0	2.0	2.0	1.9	1.9	2.1	2.3	2.5	2.7	2.5	2.1	2.2	2.3	2.1	2.1	2.0	2.0	1.9	1.7	1.7	1.8	1.9	2.0
2.5	2.6	2.7	2.7	2.7	2.6	2.5	2.3	2.2	2.3	2.5	2.4	2.4	2.4	2.4	2.3	2.2	2.0	2.0	1.9	1.9	1.9	1.8	1.7	1.7	1.8	1.7	1.7	1.8	1.8	1.9	1.9	2.1	2.2	2.4	2.4

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2001
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations



.4	.4	.3	.3	.3	.3	.3	.3	.4	.4	.6	.4	.0	-.3	-.3	.5	.3	.2	.2	.2	.2	.3	.2	.2	.2	.3	.3	.2	.3	.3	.3	.3	.3	.3	.3	.3
.4	.5	.3	.4	.4	.4	.2	.3	.3	.2	.3	.3	.6	-2.2	-2.5	.0	.4	.5	.6	.4	.3	.7	.7	.5	.5	.5	.2	.2	-.1	.2	.4	.4	.2	.4	.4	.4
.4	.3	.5	.6	.6	.4	.1	.0	.0	.2	.8	.5	.6	-.6	.1	.4	.8	.6	.5	.2	.2	.2	.4	.5	.5	.4	.5	.6	.4	.1	.2	.3	.3	.3	.2	.3
.5	.3	.3	.5	.5	.6	.5	.4	.4	.6	.2	.2	.4	.6	.6	.6	.5	.1	.2	.0	-.1	.2	.4	.5	.5	.5	.5	.3	-.1	.1	.4	.8	.6	.5	.5	.5
.6	.5	.6	.6	.6	.6	.7	.3	.1	.1	.1	.1	.3	.5	.6	.6	.5	.4	.3	.0	.0	.1	.4	.4	.7	.5	.2	.4	-.5	-.3	.3	.4	.2	.4	.5	.6
.5	.5	.5	.6	.6	.4	.6	.4	.2	.1	.1	.2	.4	.5	.5	.5	.5	.6	.6	.0	.1	.6	.8	.9	.9	.5	.0	-.4	-.9	-.5	.0	.1	.4	.5	.5	.5
.4	.4	.5	.6	.6	.5	.3	.1	.2	-.2	-.3	.3	.4	.5	.5	.5	.3	1.2	1.3	.2	.2	.5	.8	.4	.8	.2	.5	.1	-.1	.0	.1	.3	.3	.4	.3	.4
.4	.5	.5	.5	.5	.4	.3	.2	-.1	-.1	.1	.0	.4	.5	.5	.4	.1	.2	.2	.1	.2	.3	.5	.4	.5	.1	.1	-.3	-.1	.2	-.2	.2	.1	.2	.3	.4
.2	.4	.3	.4	.4	.4	.4	.3	.4	.3	.0	.1	.2	.3	.2	.3	.3	.3	.2	.2	.1	.6	.6	.5	.4	.0	.1	-.3	-.2	-.1	-.2	.2	.1	.1	.1	.2
.4	.5	.5	.6	.5	.6	.6	.5	.5	.3	.1	.1	.3	.4	.4	.5	.6	.5	.4	.3	.1	.6	.4	.4	.2	.2	.0	.1	-.1	-.1	-.4	-.3	-.2	-.4	.0	.2
.3	.4	.3	.3	.5	.5	.6	.5	.5	.4	.3	.4	.3	.6	.4	.6	.6	.5	.5	.8	.4	.5	.3	.5	.5	.5	.5	.5	.5	.4	.3	.5	.4	.3	.1	.2
.4	.4	.3	.2	.3	.4	.5	.5	.5	.6	.4	.5	.3	.3	.5	.5	.5	.5	.5	.8	.7	.4	.4	.5	.6	.6	.5	.5	.5	.4	.9	.9	.8	.4	.3	.5
.5	.5	.5	.4	.4	.4	.5	.5	.5	.5	.4	.6	.2	.4	.4	.4	.4	.4	.4	.5	.6	.5	.6	.6	.6	.6	.5	.5	.5	.4	.5	.5	.6	.4	.4	.3
.4	.4	.6	.5	.5	.5	.5	.6	.5	.5	.4	.4	.5	.5	.5	.5	.4	.4	.4	.5	.6	.5	.5	.5	.4	.4	.4	.5	.5	.5	.5	.5	.4	.6	.4	.3
.3	.4	.5	.5	.5	.5	.5	.4	.5	.5	.3	.2	.3	.2	.2	.2	.3	.2	.3	.5	.5	.5	.5	.4	.4	.2	.3	.4	.5	.4	.4	.4	.4	.4	.3	.2
.1	.1	.2	.3	.2	.2	.3	.2	.2	.1	.1	-.3	-.4	-.1	.0	.2	.5	.5	.3	.3	.3	.2	.1	-.1	.1	.3	.1	.0	-.1	.0	.0	.2	.1	.2	.1	.1
-.1	-.1	-.4	-.3	-.2	-.2	.2	.0	.2	.2	-.2	-.5	-.5	.0	.0	.3	-.4	-1.1	-1.6	-1.7	-1.6	-1.4	-1.0	-1.5	-1.4	-1.5	-.7	.0	-1.2	-1.0	-1.3	-1.4	-1.2	-1.0	-.3	-.3
-1.0	-1.1	-1.0	-.4	-.3	-.2	-.1	.8	.7	.0	-.5	-1.1	-1.0	-.9	-.8	-.9	-1.2	-1.4	-1.7	-2.0	-2.7	-2.8	-2.3	-1.9	-1.8	-1.4	-1.7	-1.9	-2.1	-2.1	-2.4	-2.3	-1.9	-.6	-.7	-.9

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). JULY 2001
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

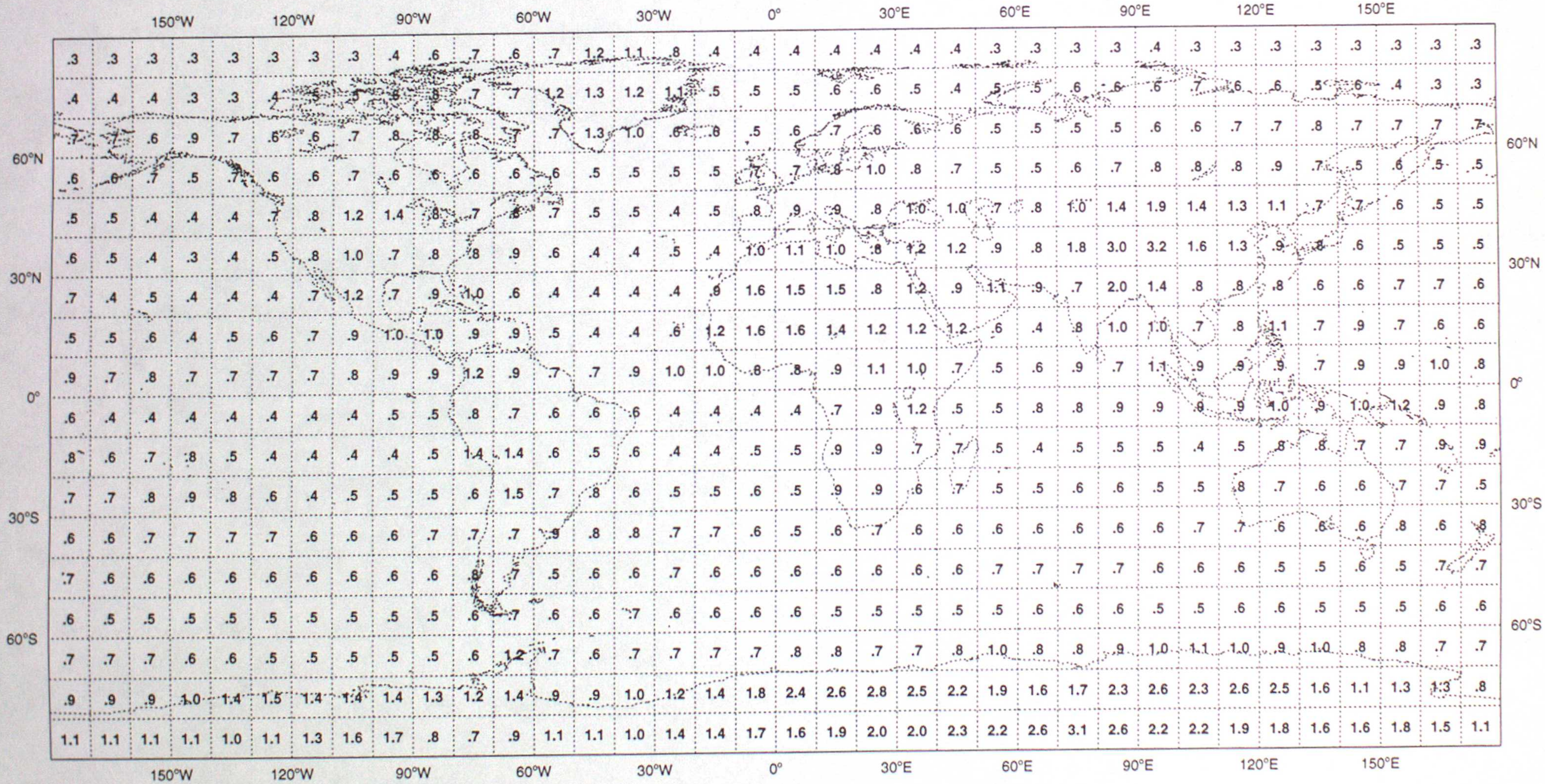
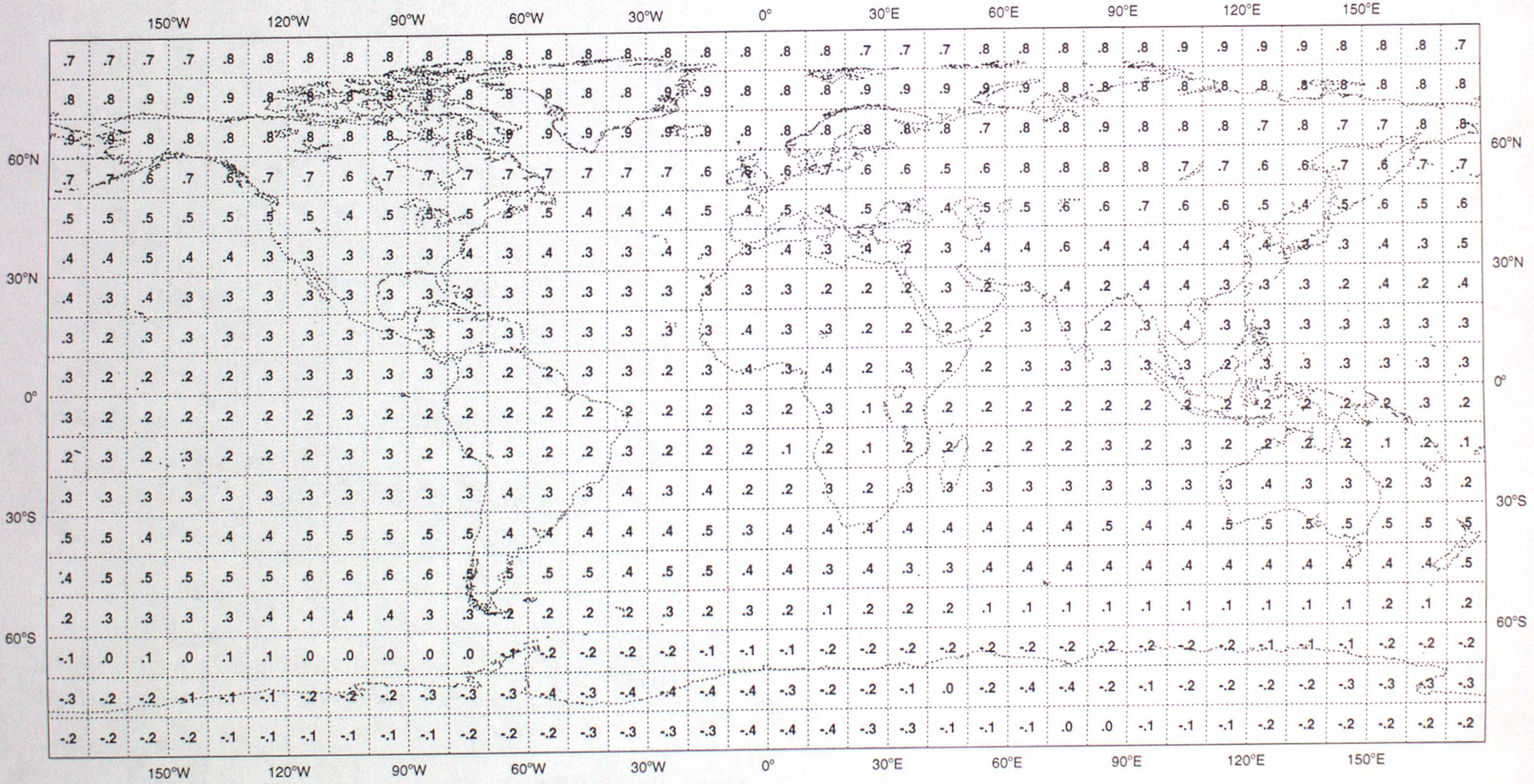

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.3 .3 .3 .3 .3 .3 .3 .3 .4 .6 .7 .6 .7 1.2 1.1 .8 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3
.4 .4 .4 .3 .3 .4 .5 .5 .6 .8 .7 .7 1.2 1.3 1.2 1.1 .5 .5 .5 .6 .6 .5 .4 .5 .5 .6 .6 .6 .7 .6 .6 .5 .6 .4 .3 .3
.7 .7 .6 .9 .7 .6 .6 .7 .8 .8 .8 .7 .7 1.3 1.0 .6 .8 .5 .6 .7 .6 .6 .6 .5 .5 .5 .5 .6 .6 .7 .7 .8 .7 .7 .7 .7
.6 .6 .7 .5 .7 .6 .6 .7 .6 .6 .6 .6 .6 .5 .5 .5 .5 .7 .7 .8 1.0 .8 .7 .5 .5 .6 .7 .8 .8 .8 .9 .7 .5 .6 .5 .5
.5 .5 .4 .4 .4 .7 .8 1.2 1.4 .8 .7 .8 .7 .5 .5 .4 .5 .8 .9 .9 .8 1.0 1.0 .7 .8 1.0 1.4 1.9 1.4 1.3 1.1 .7 .7 .6 .5 .5
.6 .5 .4 .3 .4 .5 .8 1.0 .7 .8 .8 .9 .6 .4 .4 .5 .4 1.0 1.1 1.0 .8 1.2 1.2 .9 .8 1.8 3.0 3.2 1.6 1.3 .9 .8 .6 .5 .5 .5
.7 .4 .5 .4 .4 .4 .7 1.2 .7 .9 1.0 .6 .4 .4 .4 .4 .9 1.6 1.5 1.5 .8 1.2 .9 1.1 .9 .7 2.0 1.4 .8 .8 .8 .6 .6 .7 .7 .6
.5 .5 .6 .4 .5 .6 .7 .9 1.0 1.0 .9 .9 .5 .4 .4 .6 1.2 1.6 1.6 1.4 1.2 1.2 1.2 .6 .4 .8 1.0 1.0 .7 .8 1.1 .7 .9 .7 .6 .6
.9 .7 .8 .7 .7 .7 .7 .8 .9 .9 1.2 .9 .7 .7 .9 1.0 1.0 .8 .8 .9 1.1 1.0 .7 .5 .6 .9 .7 1.1 .9 .9 .9 .7 .9 .9 1.0 .8
.6 .4 .4 .4 .4 .4 .4 .4 .5 .5 .8 .7 .6 .6 .6 .4 .4 .4 .4 .7 .9 1.2 .5 .5 .8 .8 .9 .9 .9 .9 1.0 .9 1.0 1.2 .9 .8
.8 .6 .7 .8 .5 .4 .4 .4 .4 .5 1.4 1.4 .6 .5 .6 .4 .4 .5 .5 .9 .9 .7 .7 .5 .4 .5 .5 .5 .4 .5 .8 .8 .7 .7 .9 .9
.7 .7 .8 .9 .8 .6 .4 .5 .5 .5 .6 1.5 .7 .8 .6 .5 .5 .6 .5 .9 .9 .6 .7 .5 .5 .6 .6 .5 .5 .8 .7 .6 .6 .7 .7 .5
.6 .6 .7 .7 .7 .7 .6 .6 .6 .7 .7 .7 .9 .8 .8 .7 .7 .6 .5 .6 .7 .6 .6 .6 .6 .6 .6 .6 .7 .7 .6 .6 .6 .8 .6 .8
.7 .6 .6 .6 .6 .6 .6 .6 .6 .6 .8 .7 .5 .6 .6 .7 .6 .6 .6 .6 .6 .6 .6 .7 .7 .7 .7 .6 .6 .6 .5 .5 .6 .5 .7 .7
.6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .7 .6 .6 .7 .6 .6 .6 .6 .5 .5 .5 .5 .5 .6 .6 .6 .5 .5 .6 .6 .5 .5 .5 .6 .6
.7 .7 .7 .6 .6 .5 .5 .5 .5 .5 .6 1.2 .7 .6 .7 .7 .7 .7 .8 .8 .7 .7 .8 1.0 .8 .8 .9 1.0 1.1 1.0 .9 1.0 .8 .8 .7 .7
.9 .9 .9 1.0 1.4 1.5 1.4 1.4 1.4 1.3 1.2 1.4 .9 .9 1.0 1.2 1.4 1.8 2.4 2.6 2.8 2.5 2.2 1.9 1.6 1.7 2.3 2.6 2.3 2.6 2.5 1.6 1.1 1.3 1.3 .8
1.1 1.1 1.1 1.1 1.0 1.1 1.3 1.6 1.7 .8 .7 .9 1.1 1.1 1.0 1.4 1.4 1.7 1.6 1.9 2.0 2.0 2.3 2.2 2.6 3.1 2.6 2.2 2.2 1.9 1.8 1.6 1.6 1.8 1.5 1.1

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2001
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations



.7	.7	.7	.7	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.7	.7	.7	.8	.8	.8	.8	.8	.9	.9	.9	.9	.8	.8	.8	.7
.8	.8	.9	.9	.9	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.9	.9	.8	.8	.8	.9	.9	.9	.9	.9	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8
.9	.9	.8	.8	.8	.8	.8	.8	.8	.8	.8	.9	.9	.9	.9	.9	.9	.8	.8	.8	.8	.8	.8	.7	.8	.8	.9	.8	.8	.8	.7	.8	.7	.7	.8	.8
.7	.7	.6	.7	.6	.7	.7	.6	.7	.7	.7	.7	.7	.7	.7	.7	.6	.6	.6	.7	.6	.6	.5	.6	.8	.8	.8	.8	.7	.7	.6	.6	.7	.6	.7	.7
.5	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.5	.4	.4	.4	.5	.4	.5	.4	.5	.4	.4	.5	.5	.6	.6	.7	.6	.6	.5	.4	.5	.6	.5	.6
.4	.4	.5	.4	.4	.3	.3	.3	.3	.3	.4	.3	.4	.3	.3	.4	.3	.3	.4	.3	.4	.2	.3	.4	.4	.6	.4	.4	.4	.4	.4	.3	.3	.4	.3	.5
.4	.3	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.2	.2	.2	.3	.2	.3	.4	.2	.4	.4	.3	.3	.3	.2	.4	.2	.4
.3	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.2	.2	.2	.2	.3	.3	.2	.3	.4	.3	.3	.3	.3	.3	.3	.3
.3	.2	.2	.2	.2	.3	.3	.3	.3	.3	.3	.2	.2	.3	.3	.2	.3	.4	.3	.4	.2	.3	.2	.2	.3	.3	.3	.3	.3	.2	.3	.3	.3	.3	.3	.3
.3	.2	.2	.2	.2	.2	.2	.3	.2	.2	.2	.2	.2	.2	.2	.2	.2	.3	.2	.3	.1	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.3	.2
.2	.3	.2	.3	.2	.2	.2	.3	.3	.2	.2	.3	.2	.2	.3	.2	.2	.2	.1	.2	.1	.2	.2	.2	.2	.2	.3	.2	.3	.2	.2	.2	.2	.1	.2	.1
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.4	.3	.4	.2	.2	.3	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.3	.3	.2	.3	.2
.5	.5	.4	.5	.4	.4	.5	.5	.5	.5	.5	.4	.4	.4	.4	.4	.5	.3	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.5	.5	.5	.5	.5	.5	.5
.4	.5	.5	.5	.5	.5	.6	.6	.6	.6	.5	.5	.5	.5	.4	.5	.5	.4	.4	.3	.4	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5
.2	.3	.3	.3	.3	.4	.4	.4	.4	.3	.3	.2	.2	.2	.2	.3	.2	.3	.2	.1	.2	.2	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.2	.1	.2
-.1	.0	.1	.0	.1	.1	.0	.0	.0	.0	.0	-.1	-.2	-.2	-.2	-.2	-.1	-.1	-.1	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.2	-.1	-.1	-.1	-.2	-.2	-.2
-.3	-.2	-.2	-.1	-.1	-.1	-.2	-.2	-.2	-.3	-.3	-.3	-.4	-.3	-.4	-.4	-.4	-.4	-.3	-.2	-.2	-.1	.0	-.2	-.4	-.4	-.2	-.1	-.2	-.2	-.2	-.2	-.3	-.3	-.3	-.3
-.2	-.2	-.2	-.2	-.1	-.1	-.1	-.1	-.1	-.1	-.2	-.2	-.2	-.3	-.3	-.3	-.3	-.4	-.4	-.4	-.3	-.3	-.1	-.1	-.1	-.1	.0	.0	-.1	-.1	-.1	-.2	-.2	-.2	-.2	-.2

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). JULY 2001
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

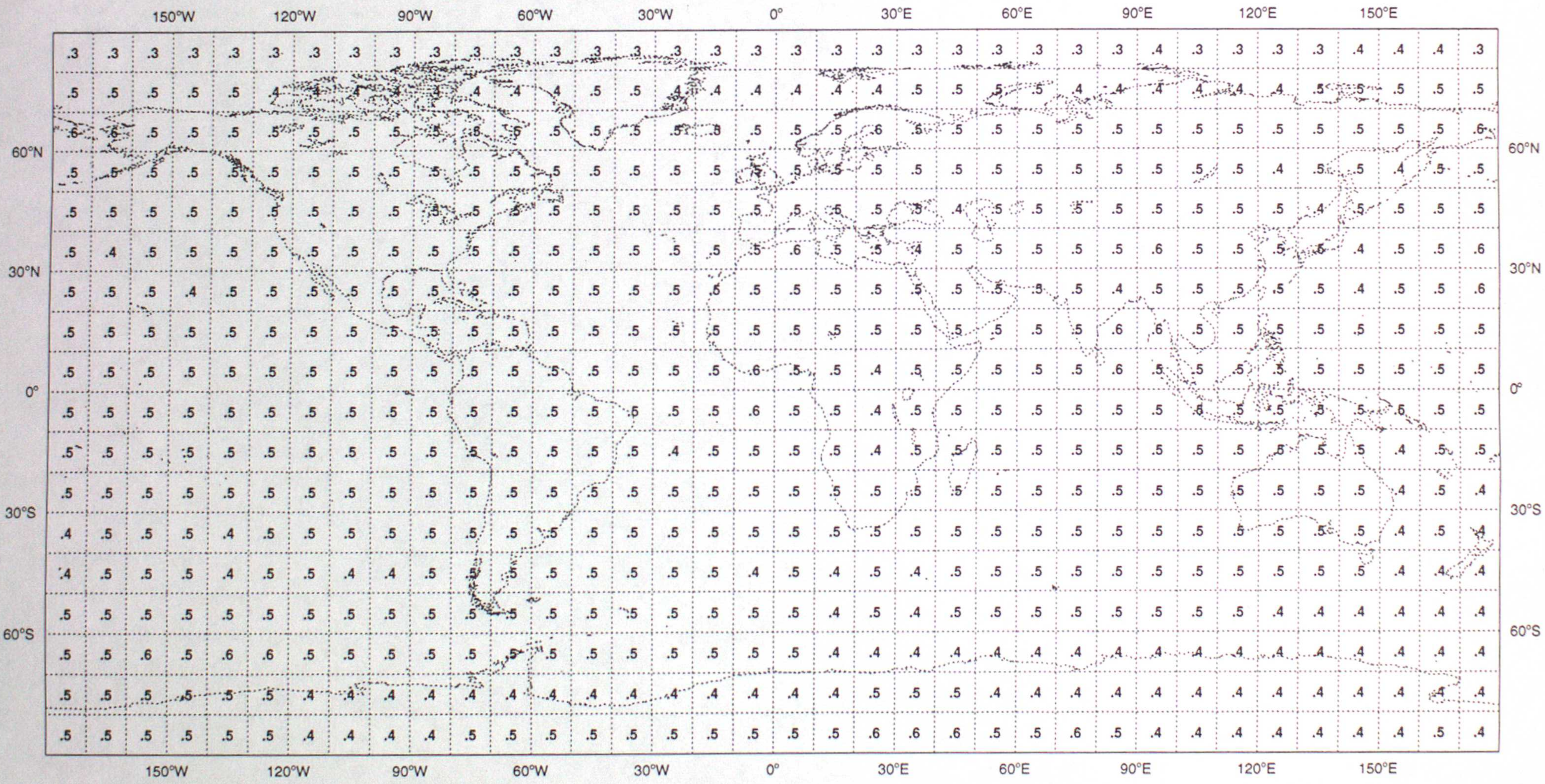
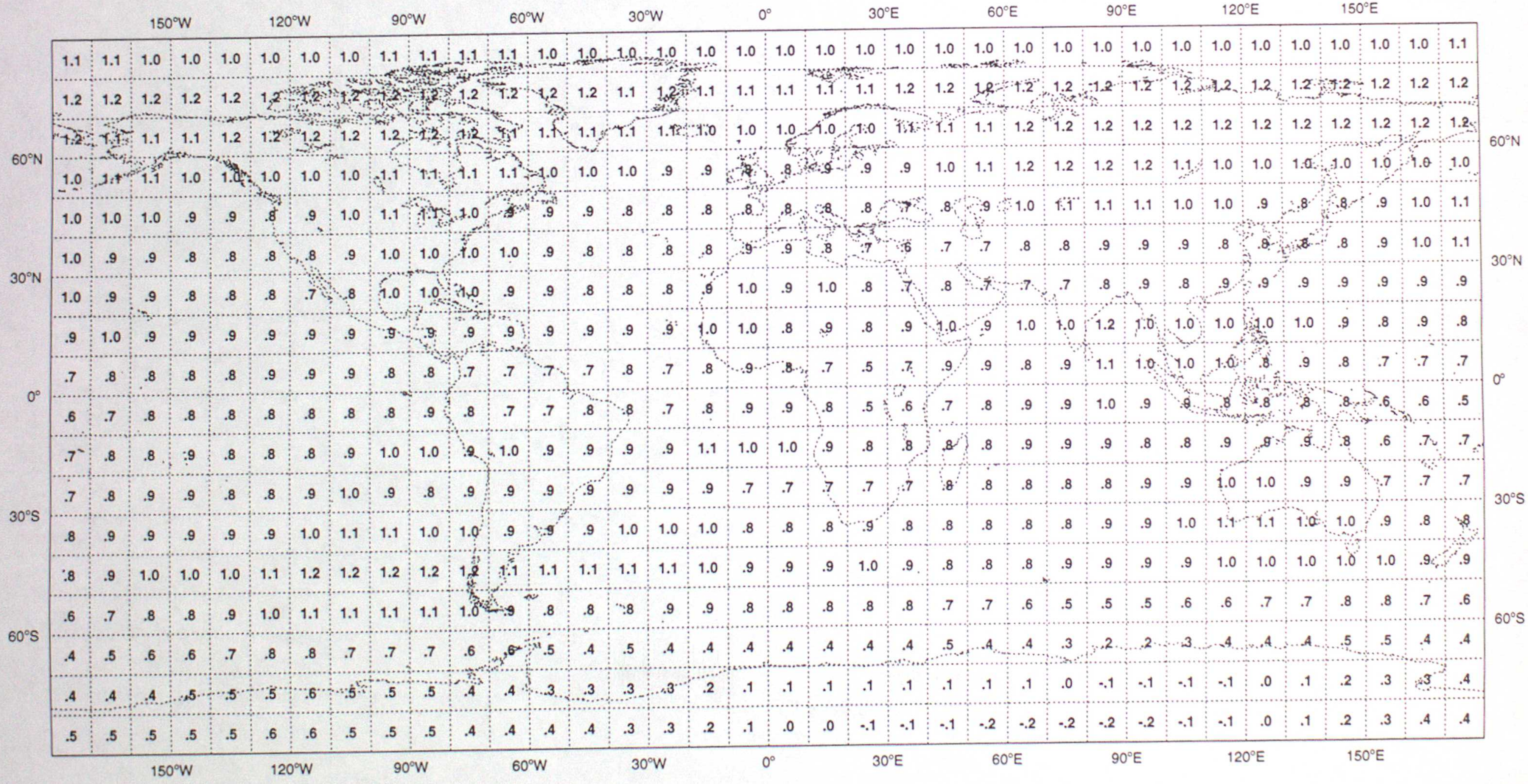

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2001
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations



1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1
1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.2	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
1.2	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
1.0	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.0	1.0	1.0	.9	.9	.8	.8	.9	.9	.9	1.0	1.1	1.2	1.2	1.2	1.2	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1.0	1.0	1.0	.9	.9	.8	.9	1.0	1.1	1.1	1.0	.9	.9	.9	.8	.8	.8	.8	.8	.8	.8	.7	.8	.9	1.0	1.1	1.1	1.1	1.0	1.0	.9	.8	.8	.9	1.0	1.1
1.0	.9	.9	.8	.8	.8	.8	.9	1.0	1.0	1.0	1.0	.9	.8	.8	.8	.8	.9	.9	.8	.7	.6	.7	.7	.8	.8	.9	.9	.9	.8	.8	.8	.8	.9	1.0	1.1
1.0	.9	.9	.8	.8	.8	.7	.8	1.0	1.0	1.0	.9	.9	.8	.8	.8	.9	1.0	.9	1.0	.8	.7	.8	.7	.7	.7	.8	.9	.8	.9	.9	.9	.9	.9	.9	.9
.9	1.0	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	1.0	1.0	.8	.9	.8	.9	1.0	.9	1.0	1.0	1.2	1.0	1.0	1.0	1.0	1.0	.9	.8	.9	.8
.7	.8	.8	.8	.8	.9	.9	.9	.8	.8	.7	.7	.7	.7	.8	.7	.8	.9	.8	.7	.5	.7	.9	.9	.8	.9	1.1	1.0	1.0	1.0	.8	.9	.8	.7	.7	.7
.6	.7	.8	.8	.8	.8	.8	.8	.8	.9	.8	.7	.7	.8	.8	.7	.8	.9	.9	.8	.5	.6	.7	.8	.9	.9	1.0	.9	.9	.8	.8	.8	.8	.6	.6	.5
.7	.8	.8	.9	.8	.8	.8	.9	1.0	1.0	.9	1.0	.9	.9	.9	.9	1.1	1.0	1.0	.9	.8	.8	.8	.8	.9	.9	.9	.8	.8	.9	.9	.9	.8	.6	.7	.7
.7	.8	.9	.9	.8	.8	.9	1.0	.9	.8	.9	.9	.9	.9	.9	.9	.9	.7	.7	.7	.7	.7	.8	.8	.8	.8	.8	.9	.9	1.0	1.0	.9	.9	.7	.7	.7
.8	.9	.9	.9	.9	.9	1.0	1.1	1.1	1.0	1.0	.9	.9	.9	1.0	1.0	1.0	.8	.8	.8	.9	.8	.8	.8	.8	.8	.9	.9	1.0	1.1	1.1	1.0	1.0	.9	.8	.8
.8	.9	1.0	1.0	1.0	1.1	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.0	.9	.9	.9	1.0	.9	.8	.8	.8	.9	.9	.9	.9	1.0	1.0	1.0	1.0	1.0	.9	.9
.6	.7	.8	.8	.9	1.0	1.1	1.1	1.1	1.1	1.0	.9	.8	.8	.8	.9	.9	.8	.8	.8	.8	.8	.7	.7	.6	.5	.5	.5	.6	.6	.7	.7	.8	.8	.7	.6
.4	.5	.6	.6	.7	.8	.8	.7	.7	.7	.6	.6	.5	.4	.5	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.3	.2	.2	.3	.4	.4	.4	.5	.5	.4	.4
.4	.4	.4	.5	.5	.5	.6	.5	.5	.5	.4	.4	.3	.3	.3	.3	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	.0	-.1	-.1	-.1	-.1	.0	.1	.2	.3	.3	.4
.5	.5	.5	.5	.5	.6	.6	.5	.5	.5	.4	.4	.4	.4	.3	.3	.2	.1	.0	.0	-.1	-.1	-.1	-.2	-.2	-.2	-.2	-.2	-.2	-.1	-.1	.0	.1	.2	.3	.4	.4

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). JULY 2001
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

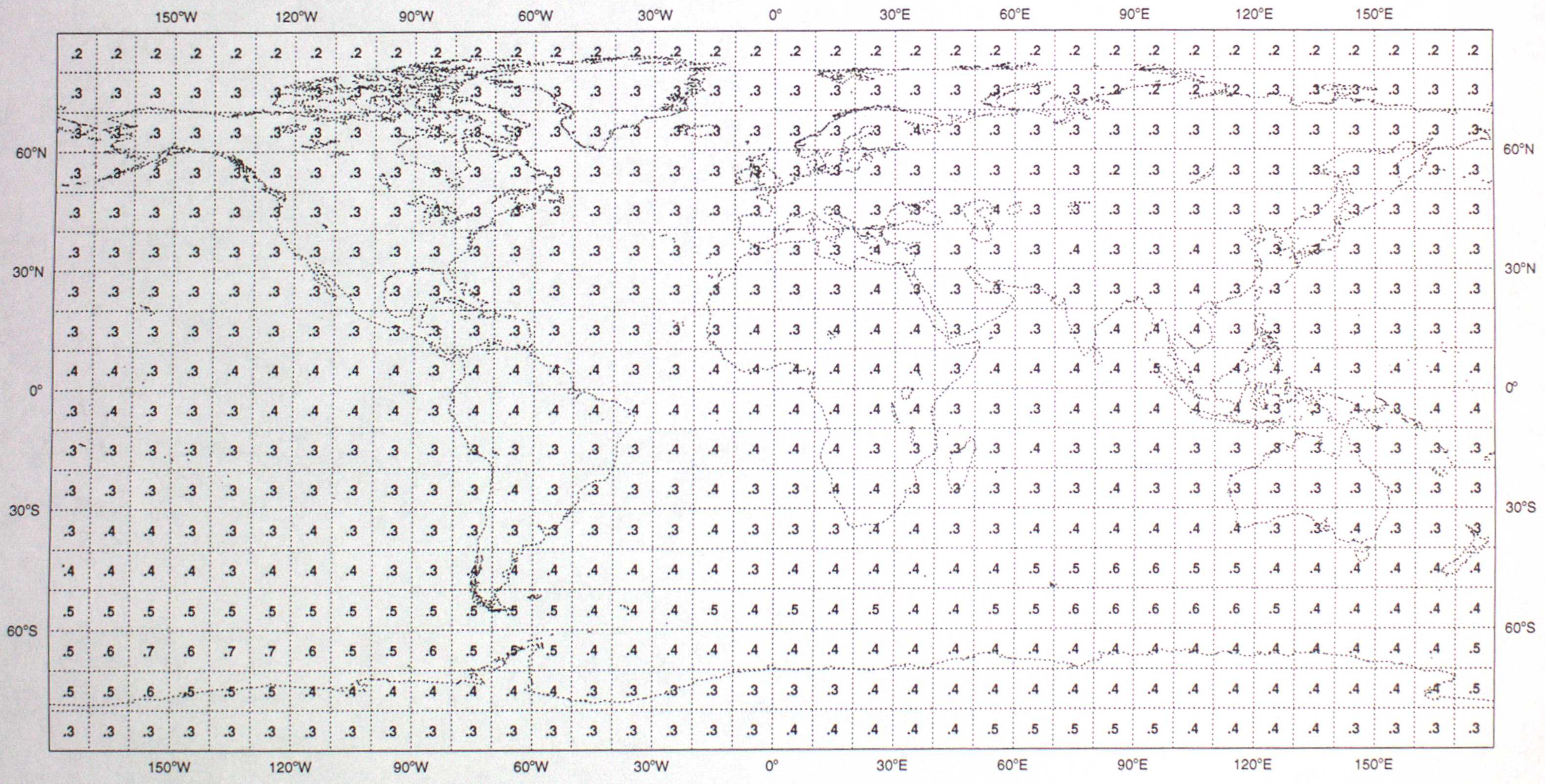
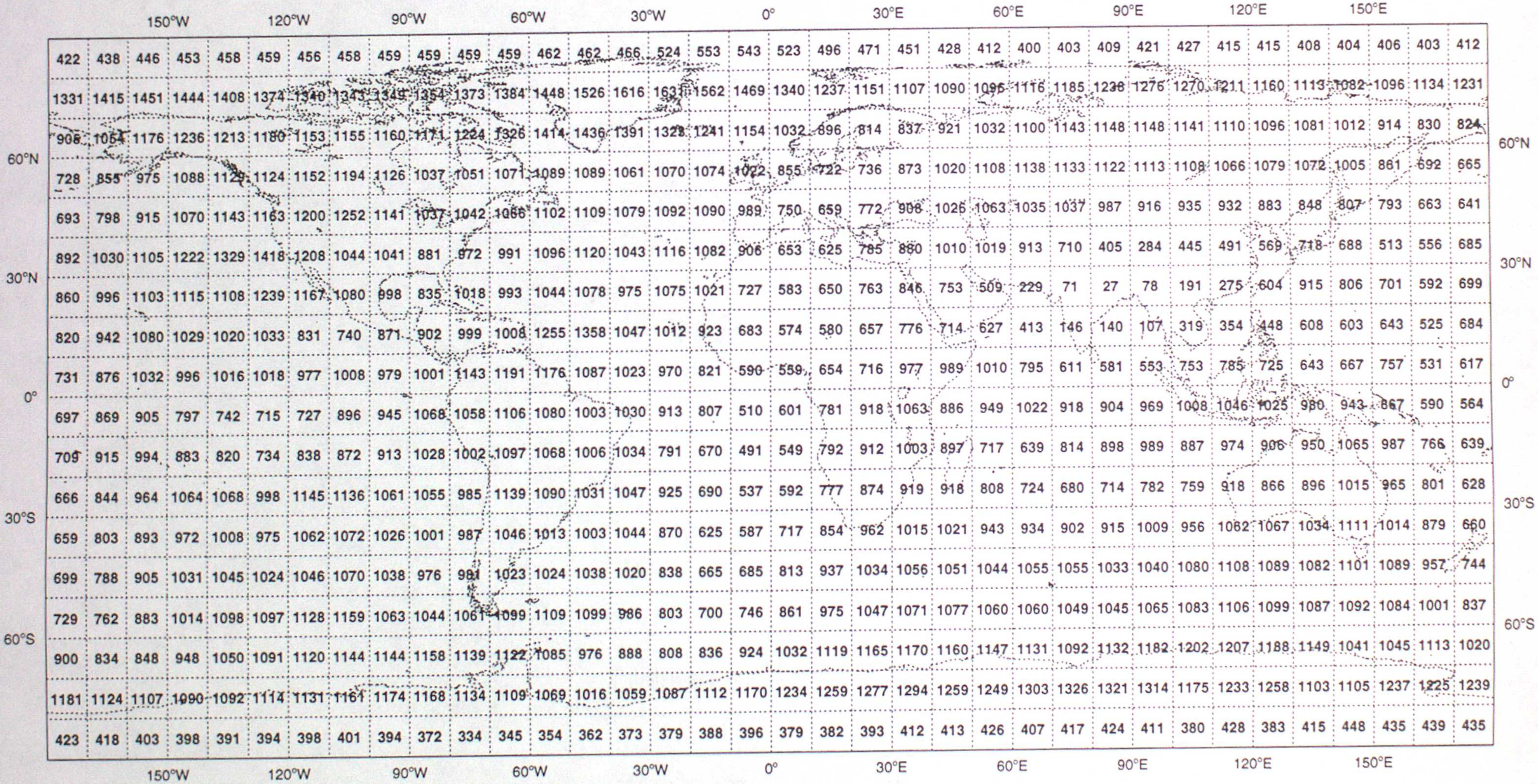

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
.2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .4 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3
.4 .4 .3 .3 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .5 .4 .4 .4 .4 .3 .4 .4 .4
.3 .4 .3 .3 .3 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .4 .3 .4 .4
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .4 .3 .3 .4 .4 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .4 .4 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .3 .3 .4 .3 .3 .3
.4 .4 .4 .4 .3 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .5 .5 .6 .6 .5 .5 .4 .4 .4 .4 .4 .4
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .5 .4 .5 .4 .5 .4 .4 .5 .5 .6 .6 .6 .6 .6 .5 .4 .4 .4 .4 .4
.5 .6 .7 .6 .7 .7 .6 .5 .5 .6 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5
.5 .5 .6 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .4 .4 .4 .4 .3 .3 .3 .3

Figure 40. ATOVS mean daily count. JULY 2001

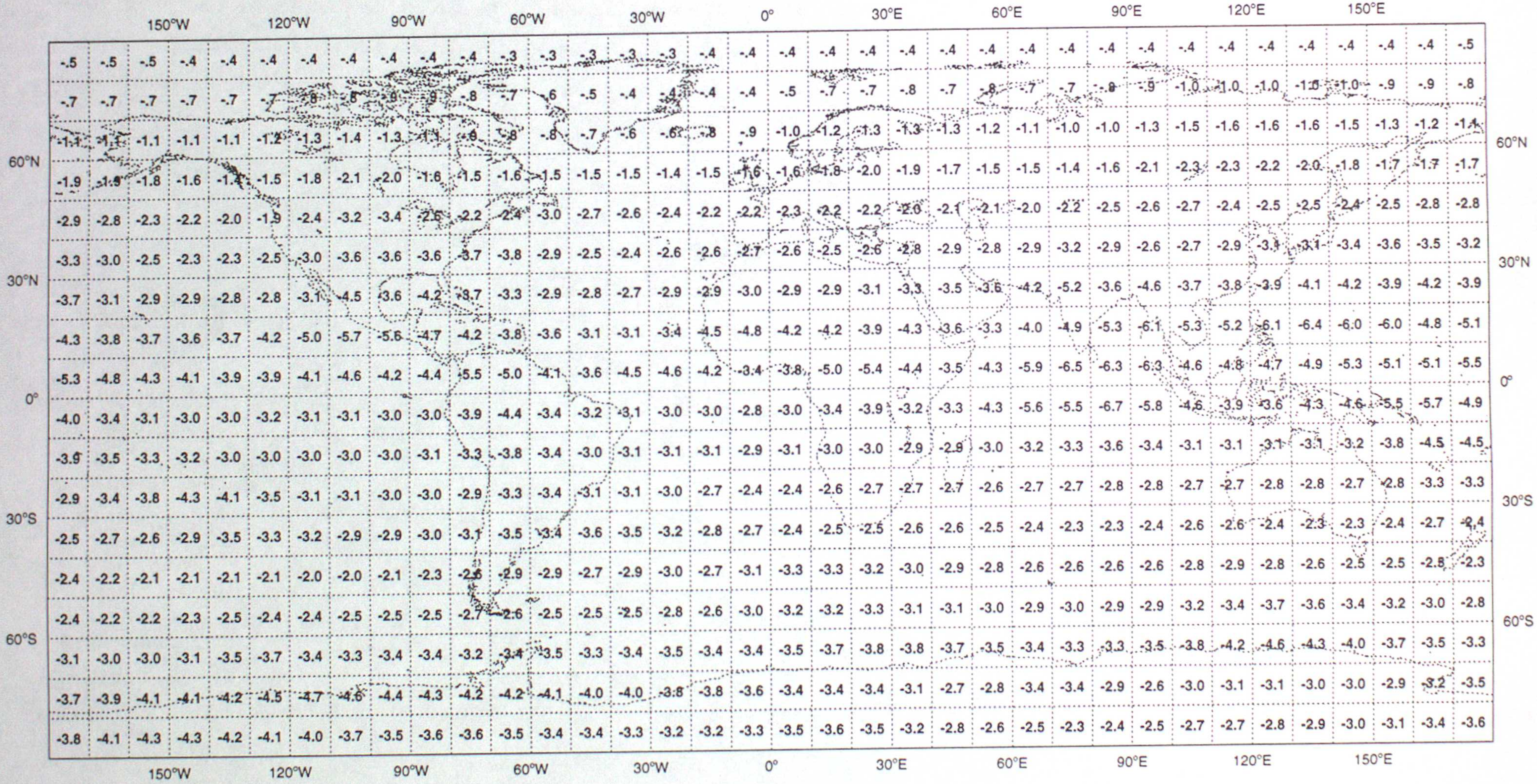
NOAA16, using all observations

Global average number of observations in 24 hours = 585864



422	438	446	453	458	459	456	458	459	459	459	459	462	462	466	524	553	543	523	496	471	451	428	412	400	403	409	421	427	415	415	408	404	406	403	412
1331	1415	1451	1444	1408	1374	1340	1343	1349	1354	1373	1384	1448	1526	1616	1631	1562	1469	1340	1237	1151	1107	1090	1095	1116	1185	1238	1276	1270	1211	1160	1113	1082	1096	1134	1231
906	1054	1176	1236	1213	1180	1153	1155	1160	1171	1224	1326	1414	1436	1391	1328	1241	1154	1032	896	814	837	921	1032	1100	1143	1148	1148	1141	1110	1096	1081	1012	914	830	824
728	855	975	1088	1129	1124	1152	1194	1126	1037	1051	1071	1089	1089	1061	1070	1074	1022	855	722	736	873	1020	1108	1138	1133	1122	1113	1108	1066	1079	1072	1005	861	692	665
693	798	915	1070	1143	1163	1200	1252	1141	1037	1042	1066	1102	1109	1079	1092	1090	989	750	659	772	908	1026	1063	1035	1037	987	916	935	932	883	848	807	793	663	641
892	1030	1105	1222	1329	1418	1208	1044	1041	881	872	991	1096	1120	1043	1116	1082	906	653	625	785	880	1010	1019	913	710	405	284	445	491	569	718	688	513	556	685
860	996	1103	1115	1108	1239	1167	1080	998	835	1018	993	1044	1078	975	1075	1021	727	583	650	763	846	753	509	229	71	27	78	191	275	604	915	806	701	592	699
820	942	1080	1029	1020	1033	831	740	871	902	999	1008	1255	1358	1047	1012	923	683	574	580	657	776	714	627	413	146	140	107	319	354	448	608	603	643	525	684
731	876	1032	996	1016	1018	977	1008	979	1001	1143	1191	1176	1087	1023	970	821	590	559	654	716	977	989	1010	795	611	581	553	753	785	725	643	667	757	531	617
697	869	905	797	742	715	727	896	945	1068	1058	1106	1080	1003	1030	913	807	510	601	781	918	1063	886	949	1022	918	904	969	1008	1046	1025	980	943	867	590	564
709	915	994	883	820	734	838	872	913	1028	1002	1097	1068	1006	1034	791	670	491	549	792	912	1003	897	717	639	814	898	989	887	974	906	950	1065	987	766	639
666	844	964	1064	1068	998	1145	1136	1061	1055	985	1139	1090	1031	1047	925	690	537	592	777	874	919	918	808	724	680	714	782	759	918	866	896	1015	965	801	628
659	803	893	972	1008	975	1062	1072	1026	1001	987	1046	1013	1003	1044	870	625	587	717	854	962	1015	1021	943	934	902	915	1009	956	1062	1067	1034	1111	1014	879	660
699	788	905	1031	1045	1024	1046	1070	1038	976	981	1023	1024	1038	1020	838	665	685	813	937	1034	1056	1051	1044	1055	1055	1033	1040	1080	1108	1089	1082	1101	1089	957	744
729	762	883	1014	1098	1097	1128	1159	1063	1044	1061	1099	1109	1099	986	803	700	746	861	975	1047	1071	1077	1060	1060	1049	1045	1065	1083	1106	1099	1087	1092	1084	1001	837
900	834	848	948	1050	1091	1120	1144	1144	1158	1139	1122	1085	976	888	808	836	924	1032	1119	1165	1170	1160	1147	1131	1092	1132	1182	1202	1207	1188	1149	1041	1045	1113	1020
1181	1124	1107	1090	1092	1114	1131	1161	1174	1168	1134	1109	1069	1016	1059	1087	1112	1170	1234	1259	1277	1294	1259	1249	1303	1326	1321	1314	1175	1233	1258	1103	1105	1237	1225	1239
423	418	403	398	391	394	398	401	394	372	334	345	354	362	373	379	388	396	379	382	393	412	413	426	407	417	424	411	380	428	383	415	448	435	439	435

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2001
Channel: HIRS8 (Surface)
NOAA16, using all observations

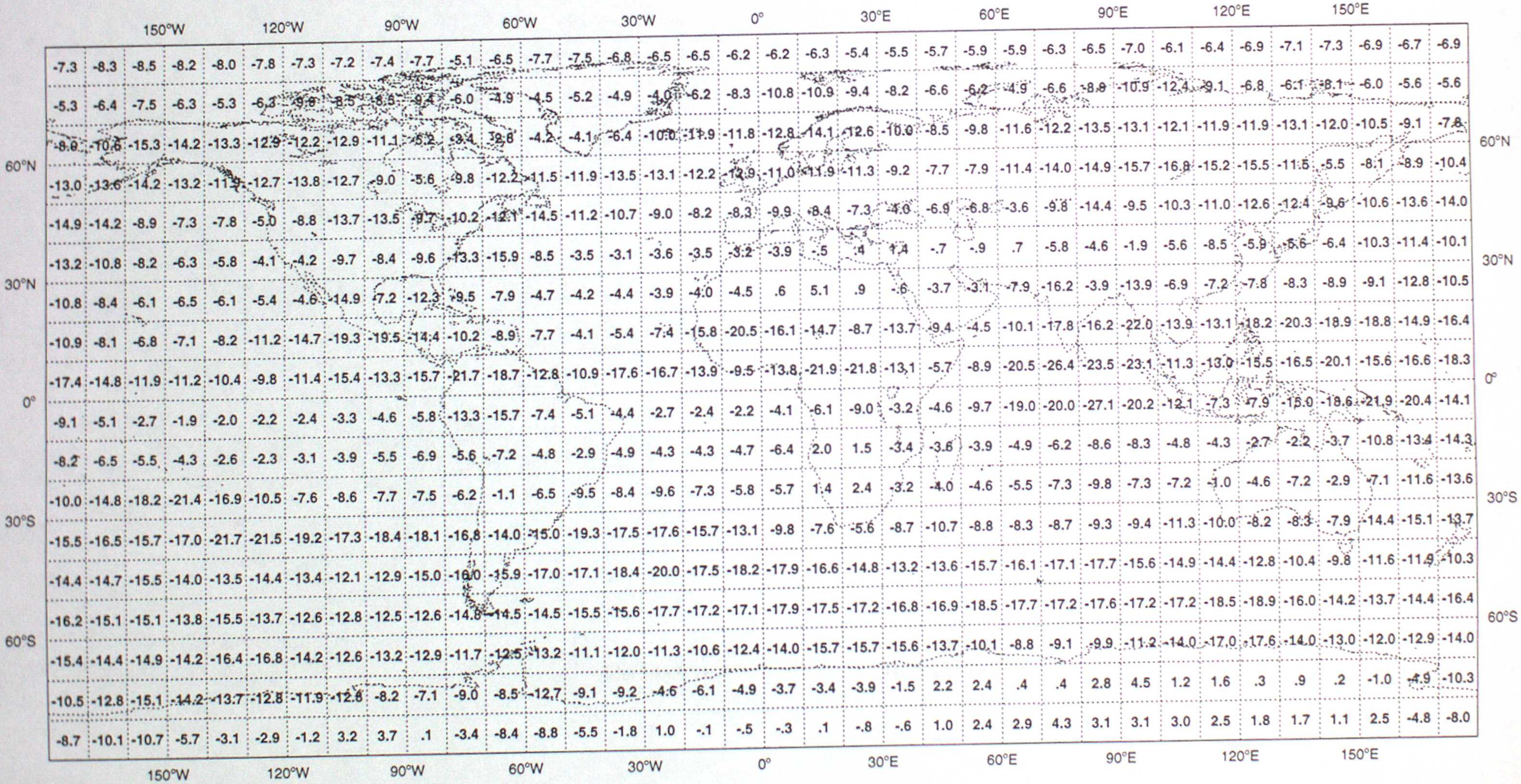


-.5	-.5	-.5	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.3	-.3	-.3	-.3	-.3	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.5
-.7	-.7	-.7	-.7	-.7	-.7	-.8	-.8	-.9	-.9	-.8	-.7	-.6	-.5	-.4	-.4	-.4	-.4	-.5	-.7	-.7	-.8	-.7	-.8	-.7	-.7	-.8	-.9	-1.0	-1.0	-1.0	-1.0	-1.0	-.9	-.9	-.8
-1.1	-1.1	-1.1	-1.1	-1.1	-1.2	-1.3	-1.4	-1.3	-1.1	-.9	-.8	-.8	-.7	-.6	-.6	-.8	-.9	-1.0	-1.2	-1.3	-1.3	-1.3	-1.2	-1.1	-1.0	-1.0	-1.3	-1.5	-1.6	-1.6	-1.6	-1.5	-1.3	-1.2	-1.1
-1.9	-1.9	-1.8	-1.6	-1.4	-1.5	-1.8	-2.1	-2.0	-1.6	-1.5	-1.6	-1.5	-1.5	-1.5	-1.4	-1.5	-1.6	-1.6	-1.8	-2.0	-1.9	-1.7	-1.5	-1.5	-1.4	-1.6	-2.1	-2.3	-2.3	-2.2	-2.0	-1.8	-1.7	-1.7	-1.7
-2.9	-2.8	-2.3	-2.2	-2.0	-1.9	-2.4	-3.2	-3.4	-2.6	-2.2	-2.4	-3.0	-2.7	-2.6	-2.4	-2.2	-2.2	-2.3	-2.2	-2.2	-2.0	-2.1	-2.1	-2.0	-2.2	-2.5	-2.6	-2.7	-2.4	-2.5	-2.5	-2.4	-2.5	-2.8	-2.8
-3.3	-3.0	-2.5	-2.3	-2.3	-2.5	-3.0	-3.6	-3.6	-3.6	-3.7	-3.8	-2.9	-2.5	-2.4	-2.6	-2.6	-2.7	-2.6	-2.5	-2.6	-2.8	-2.9	-2.8	-2.9	-3.2	-2.9	-2.6	-2.7	-2.9	-3.1	-3.1	-3.4	-3.6	-3.5	-3.2
-3.7	-3.1	-2.9	-2.9	-2.8	-2.8	-3.1	-4.5	-3.6	-4.2	-3.7	-3.3	-2.9	-2.8	-2.7	-2.9	-2.9	-3.0	-2.9	-2.9	-3.1	-3.3	-3.5	-3.6	-4.2	-5.2	-3.6	-4.6	-3.7	-3.8	-3.9	-4.1	-4.2	-3.9	-4.2	-3.9
-4.3	-3.8	-3.7	-3.6	-3.7	-4.2	-5.0	-5.7	-5.6	-4.7	-4.2	-3.8	-3.6	-3.1	-3.1	-3.4	-4.5	-4.8	-4.2	-4.2	-3.9	-4.3	-3.6	-3.3	-4.0	-4.9	-5.3	-6.1	-5.3	-5.2	-6.1	-6.4	-6.0	-6.0	-4.8	-5.1
-5.3	-4.8	-4.3	-4.1	-3.9	-3.9	-4.1	-4.6	-4.2	-4.4	-5.5	-5.0	-4.1	-3.6	-4.5	-4.6	-4.2	-3.4	-3.8	-5.0	-5.4	-4.4	-3.5	-4.3	-5.9	-6.5	-6.3	-6.3	-4.6	-4.8	-4.7	-4.9	-5.3	-5.1	-5.1	-5.5
-4.0	-3.4	-3.1	-3.0	-3.0	-3.2	-3.1	-3.1	-3.0	-3.0	-3.9	-4.4	-3.4	-3.2	-3.1	-3.0	-3.0	-2.8	-3.0	-3.4	-3.9	-3.2	-3.3	-4.3	-5.6	-5.5	-6.7	-5.8	-4.6	-3.9	-3.6	-4.3	-4.6	-5.5	-5.7	-4.9
-3.9	-3.5	-3.3	-3.2	-3.0	-3.0	-3.0	-3.0	-3.0	-3.1	-3.3	-3.8	-3.4	-3.0	-3.1	-3.1	-3.1	-2.9	-3.1	-3.0	-3.0	-2.9	-2.9	-3.0	-3.2	-3.3	-3.6	-3.4	-3.1	-3.1	-3.1	-3.1	-3.2	-3.8	-4.5	-4.5
-2.9	-3.4	-3.8	-4.3	-4.1	-3.5	-3.1	-3.1	-3.0	-3.0	-2.9	-3.3	-3.4	-3.1	-3.1	-3.0	-2.7	-2.4	-2.4	-2.6	-2.7	-2.7	-2.7	-2.6	-2.7	-2.7	-2.8	-2.8	-2.7	-2.7	-2.8	-2.8	-2.7	-2.8	-3.3	-3.3
-2.5	-2.7	-2.6	-2.9	-3.5	-3.3	-3.2	-2.9	-2.9	-3.0	-3.1	-3.5	-3.4	-3.6	-3.5	-3.2	-2.8	-2.7	-2.4	-2.5	-2.5	-2.6	-2.6	-2.5	-2.4	-2.3	-2.3	-2.4	-2.6	-2.6	-2.4	-2.3	-2.3	-2.4	-2.7	-2.4
-2.4	-2.2	-2.1	-2.1	-2.1	-2.1	-2.0	-2.0	-2.1	-2.3	-2.6	-2.9	-2.9	-2.7	-2.9	-3.0	-2.7	-3.1	-3.3	-3.3	-3.2	-3.0	-2.9	-2.8	-2.6	-2.6	-2.6	-2.6	-2.8	-2.9	-2.8	-2.6	-2.5	-2.5	-2.8	-2.3
-2.4	-2.2	-2.2	-2.3	-2.5	-2.4	-2.4	-2.5	-2.5	-2.5	-2.7	-2.6	-2.5	-2.5	-2.5	-2.8	-2.6	-3.0	-3.2	-3.2	-3.3	-3.1	-3.1	-3.0	-2.9	-3.0	-2.9	-2.9	-3.2	-3.4	-3.7	-3.6	-3.4	-3.2	-3.0	-2.8
-3.1	-3.0	-3.0	-3.1	-3.5	-3.7	-3.4	-3.3	-3.4	-3.4	-3.2	-3.4	-3.5	-3.3	-3.4	-3.5	-3.4	-3.4	-3.5	-3.7	-3.8	-3.8	-3.7	-3.5	-3.4	-3.3	-3.3	-3.5	-3.8	-4.2	-4.6	-4.3	-4.0	-3.7	-3.5	-3.3
-3.7	-3.9	-4.1	-4.1	-4.2	-4.5	-4.7	-4.6	-4.4	-4.3	-4.2	-4.2	-4.1	-4.0	-4.0	-3.8	-3.8	-3.6	-3.4	-3.4	-3.4	-3.1	-2.7	-2.8	-3.4	-3.4	-2.9	-2.6	-3.0	-3.1	-3.1	-3.0	-3.0	-2.9	-3.2	-3.5
-3.8	-4.1	-4.3	-4.3	-4.2	-4.1	-4.0	-3.7	-3.5	-3.6	-3.6	-3.5	-3.4	-3.4	-3.3	-3.2	-3.2	-3.3	-3.5	-3.6	-3.5	-3.2	-2.8	-2.6	-2.5	-2.3	-2.4	-2.5	-2.7	-2.7	-2.8	-2.9	-3.0	-3.1	-3.4	-3.6

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). JULY 2001

Channel: HIRS8 (Surface)

NOAA16, using all observations



-7.3	-8.3	-8.5	-8.2	-8.0	-7.8	-7.3	-7.2	-7.4	-7.7	-5.1	-6.5	-7.7	-7.5	-6.8	-6.5	-6.5	-6.2	-6.2	-6.3	-5.4	-5.5	-5.7	-5.9	-5.9	-6.3	-6.5	-7.0	-6.1	-6.4	-6.9	-7.1	-7.3	-6.9	-6.7	-6.9
-5.3	-6.4	-7.5	-6.3	-5.3	-6.3	-9.8	-8.5	-8.5	-9.4	-6.0	-4.9	-4.5	-5.2	-4.9	-4.0	-6.2	-8.3	-10.8	-10.9	-9.4	-8.2	-6.6	-6.2	-4.9	-6.6	-8.8	-10.9	-12.4	-9.1	-6.8	-6.1	-8.1	-6.0	-5.6	-5.6
-8.8	-10.6	-15.3	-14.2	-13.3	-12.9	-12.2	-12.9	-11.1	-5.2	-3.4	-2.8	-4.2	-4.1	-6.4	-10.0	-11.9	-11.8	-12.8	-14.1	-12.6	-10.0	-8.5	-9.8	-11.6	-12.2	-13.5	-13.1	-12.1	-11.9	-11.9	-13.1	-12.0	-10.5	-9.1	-7.8
-13.0	-13.6	-14.2	-13.2	-11.9	-12.7	-13.8	-12.7	-9.0	-5.6	-9.8	-12.2	-11.5	-11.9	-13.5	-13.1	-12.2	-12.9	-11.0	-11.9	-11.3	-9.2	-7.7	-7.9	-11.4	-14.0	-14.9	-15.7	-16.8	-15.2	-15.5	-11.5	-5.5	-8.1	-8.9	-10.4
-14.9	-14.2	-8.9	-7.3	-7.8	-5.0	-8.8	-13.7	-13.5	-9.7	-10.2	-12.1	-14.5	-11.2	-10.7	-9.0	-8.2	-8.3	-9.9	-8.4	-7.3	-4.0	-6.9	-6.8	-3.6	-9.8	-14.4	-9.5	-10.3	-11.0	-12.6	-12.4	-9.6	-10.6	-13.6	-14.0
-13.2	-10.8	-8.2	-6.3	-5.8	-4.1	-4.2	-9.7	-8.4	-9.6	-13.3	-15.9	-8.5	-3.5	-3.1	-3.6	-3.5	-3.2	-3.9	-.5	.4	1.4	-.7	-.9	.7	-5.8	-4.6	-1.9	-5.6	-8.5	-5.9	-5.6	-6.4	-10.3	-11.4	-10.1
-10.8	-8.4	-6.1	-6.5	-6.1	-5.4	-4.6	-14.9	-7.2	-12.3	-9.5	-7.9	-4.7	-4.2	-4.4	-3.9	-4.0	-4.5	.6	5.1	.9	-.6	-3.7	-3.1	-7.9	-16.2	-3.9	-13.9	-6.9	-7.2	-7.8	-8.3	-8.9	-9.1	-12.8	-10.5
-10.9	-8.1	-6.8	-7.1	-8.2	-11.2	-14.7	-19.3	-19.5	-14.4	-10.2	-8.9	-7.7	-4.1	-5.4	-7.4	-15.8	-20.5	-16.1	-14.7	-8.7	-13.7	-9.4	-4.5	-10.1	-17.8	-16.2	-22.0	-13.9	-13.1	-18.2	-20.3	-18.9	-18.8	-14.9	-16.4
-17.4	-14.8	-11.9	-11.2	-10.4	-9.8	-11.4	-15.4	-13.3	-15.7	-21.7	-18.7	-12.8	-10.9	-17.6	-16.7	-13.9	-9.5	-13.8	-21.9	-21.8	-13.1	-5.7	-8.9	-20.5	-26.4	-23.5	-23.1	-11.3	-13.0	-15.5	-16.5	-20.1	-15.6	-16.6	-18.3
-9.1	-5.1	-2.7	-1.9	-2.0	-2.2	-2.4	-3.3	-4.6	-5.8	-13.3	-15.7	-7.4	-5.1	-4.4	-2.7	-2.4	-2.2	-4.1	-6.1	-9.0	-3.2	-4.6	-9.7	-19.0	-20.0	-27.1	-20.2	-12.1	-7.3	-7.9	-15.0	-18.6	-21.9	-20.4	-14.1
-8.2	-6.5	-5.5	-4.3	-2.6	-2.3	-3.1	-3.9	-5.5	-6.9	-5.6	-7.2	-4.8	-2.9	-4.9	-4.3	-4.3	-4.7	-6.4	2.0	1.5	-3.4	-3.6	-3.9	-4.9	-6.2	-8.6	-8.3	-4.8	-4.3	-2.7	-2.2	-3.7	-10.8	-13.4	-14.3
-10.0	-14.8	-18.2	-21.4	-16.9	-10.5	-7.6	-8.6	-7.7	-7.5	-6.2	-1.1	-6.5	-9.5	-8.4	-9.6	-7.3	-5.8	-5.7	1.4	2.4	-3.2	-4.0	-4.6	-5.5	-7.3	-9.8	-7.3	-7.2	-1.0	-4.6	-7.2	-2.9	-7.1	-11.6	-13.6
-15.5	-16.5	-15.7	-17.0	-21.7	-21.5	-19.2	-17.3	-18.4	-18.1	-16.8	-14.0	-15.0	-19.3	-17.5	-17.6	-15.7	-13.1	-9.8	-7.6	-5.6	-8.7	-10.7	-8.8	-8.3	-8.7	-9.3	-9.4	-11.3	-10.0	-8.2	-8.3	-7.9	-14.4	-15.1	-13.7
-14.4	-14.7	-15.5	-14.0	-13.5	-14.4	-13.4	-12.1	-12.9	-15.0	-16.0	-15.9	-17.0	-17.1	-18.4	-20.0	-17.5	-18.2	-17.9	-16.6	-14.8	-13.2	-13.6	-15.7	-16.1	-17.1	-17.7	-15.6	-14.9	-14.4	-12.8	-10.4	-9.8	-11.6	-11.9	-10.3
-16.2	-15.1	-15.1	-13.8	-15.5	-13.7	-12.6	-12.8	-12.5	-12.6	-14.8	-14.5	-14.5	-15.5	-15.6	-17.7	-17.2	-17.1	-17.9	-17.5	-17.2	-16.8	-16.9	-18.5	-17.7	-17.2	-17.6	-17.2	-17.2	-18.5	-18.9	-16.0	-14.2	-13.7	-14.4	-16.4
-15.4	-14.4	-14.9	-14.2	-16.4	-16.8	-14.2	-12.6	-13.2	-12.9	-11.7	-12.5	-13.2	-11.1	-12.0	-11.3	-10.6	-12.4	-14.0	-15.7	-15.7	-15.6	-13.7	-10.1	-8.8	-9.1	-9.9	-11.2	-14.0	-17.0	-17.6	-14.0	-13.0	-12.0	-12.9	-14.0
-10.5	-12.8	-15.1	-14.2	-13.7	-12.8	-11.9	-12.8	-8.2	-7.1	-9.0	-8.5	-12.7	-9.1	-9.2	-4.6	-6.1	-4.9	-3.7	-3.4	-3.9	-1.5	2.2	2.4	.4	.4	2.8	4.5	1.2	1.6	.3	.9	.2	-1.0	-4.9	-10.3
-8.7	-10.1	-10.7	-5.7	-3.1	-2.9	-1.2	3.2	3.7	.1	-3.4	-8.4	-8.8	-5.5	-1.8	1.0	-.1	-.5	-.3	.1	-.8	-.6	1.0	2.4	2.9	4.3	3.1	3.1	3.0	2.5	1.8	1.7	1.1	2.5	-4.8	-8.0

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2001
Channel: HIRS15 (700 hPa)
NOAA16, using all observations

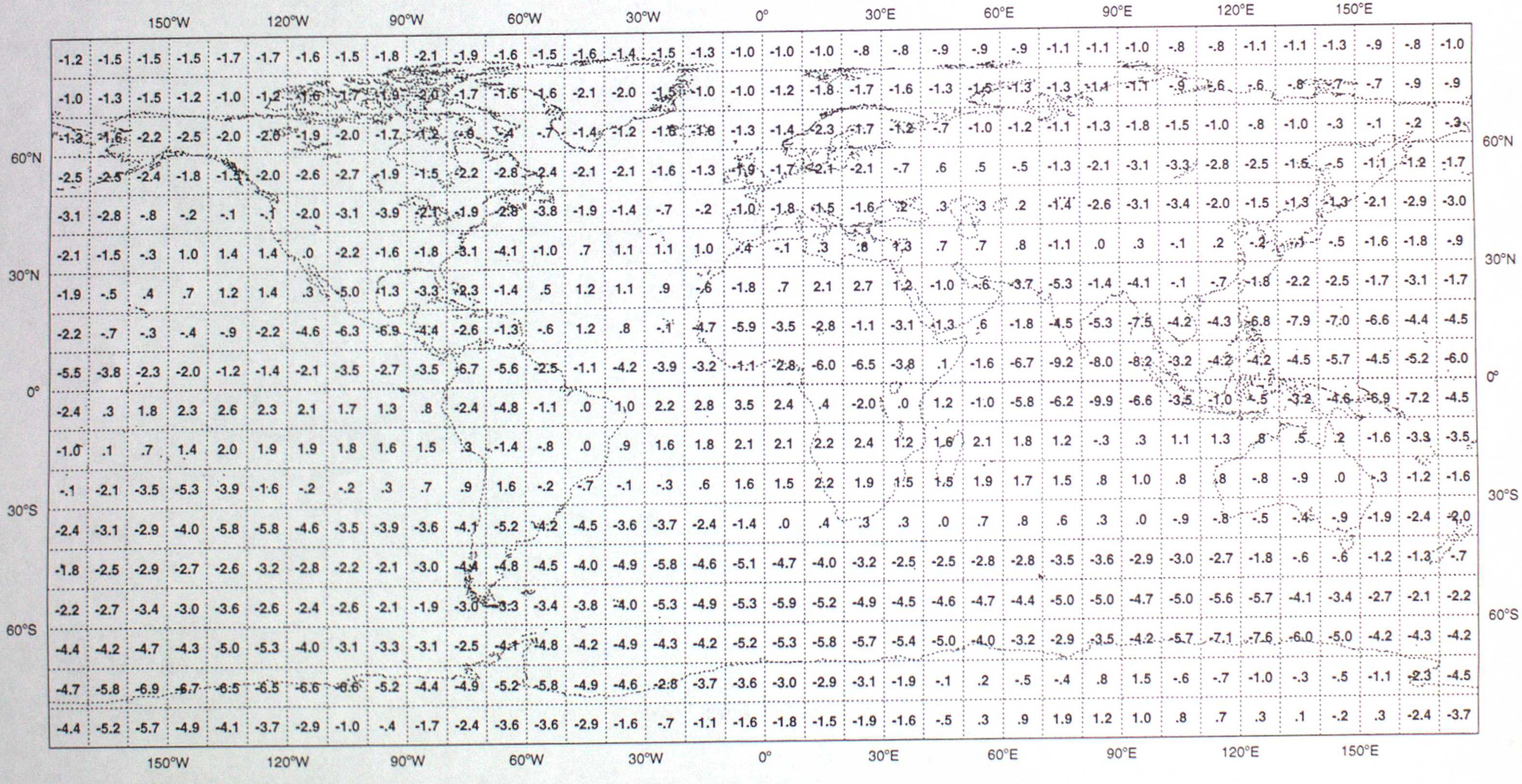
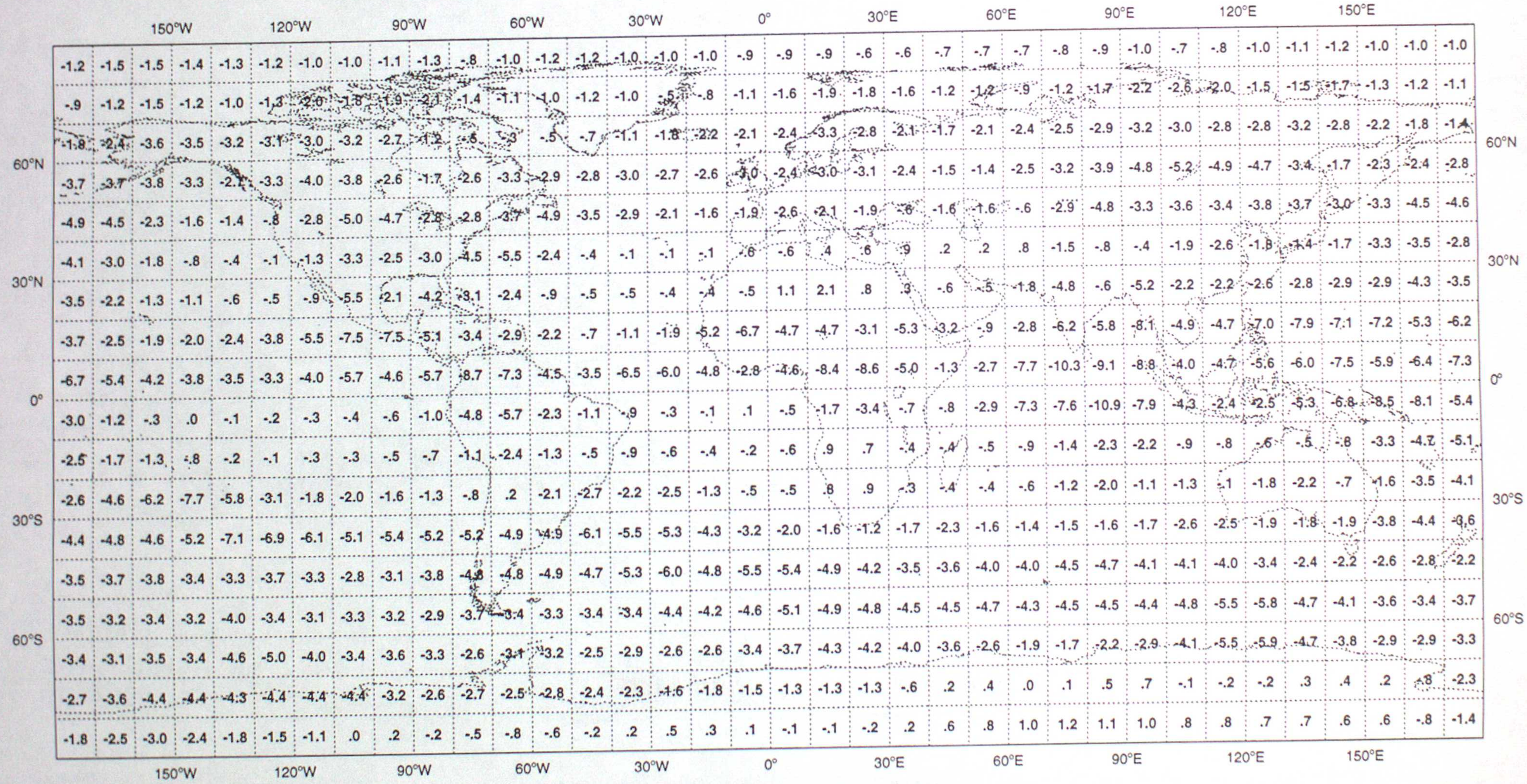

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-1.2 -1.5 -1.5 -1.5 -1.7 -1.7 -1.6 -1.5 -1.8 -2.1 -1.9 -1.6 -1.5 -1.6 -1.4 -1.5 -1.3 -1.0 -1.0 -1.0 -.8 -.8 -.9 -.9 -.9 -1.1 -1.1 -1.0 -.8 -.8 -1.1 -1.1 -1.3 -.9 -.8 -1.0
-1.0 -1.3 -1.5 -1.2 -1.0 -1.2 -1.6 -1.7 -1.9 -2.0 -1.7 -1.6 -1.6 -2.1 -2.0 -1.5 -1.0 -1.0 -1.2 -1.8 -1.7 -1.6 -1.3 -1.5 -1.3 -1.3 -1.4 -1.1 -.9 -.6 -.6 -.8 -.7 -.7 -.9 -.9
-1.3 -1.6 -2.2 -2.5 -2.0 -2.8 -1.9 -2.0 -1.7 -1.2 -.8 -.4 -.7 -1.4 -1.2 -1.8 -1.8 -1.3 -1.4 -2.3 -1.7 -1.2 -.7 -1.0 -1.2 -1.1 -1.3 -1.8 -1.5 -1.0 -.8 -1.0 -.3 -.1 -.2 -.3
-2.5 -2.5 -2.4 -1.8 -1.5 -2.0 -2.6 -2.7 -1.9 -1.5 -2.2 -2.8 -2.4 -2.1 -2.1 -1.6 -1.3 -1.9 -1.7 -2.1 -2.1 -.7 .6 .5 -.5 -1.3 -2.1 -3.1 -3.3 -2.8 -2.5 -1.5 -.5 -1.1 -1.2 -1.7
-3.1 -2.8 -.8 -.2 -.1 -.1 -2.0 -3.1 -3.9 -2.1 -1.9 -2.8 -3.8 -1.9 -1.4 -.7 -.2 -1.0 -1.8 -1.5 -1.6 .2 .3 .3 .2 -1.4 -2.6 -3.1 -3.4 -2.0 -1.5 -1.3 -1.3 -2.1 -2.9 -3.0
-2.1 -1.5 -.3 1.0 1.4 1.4 .0 -2.2 -1.6 -1.8 -3.1 -4.1 -1.0 .7 1.1 1.1 1.0 -.4 -.1 .3 .8 1.3 .7 .7 .8 -1.1 .0 .3 -.1 .2 -.2 -.1 -.5 -1.6 -1.8 -.9
-1.9 -.5 .4 .7 1.2 1.4 .3 -5.0 -1.3 -3.3 -2.3 -1.4 .5 1.2 1.1 .9 -.6 -1.8 .7 2.1 2.7 1.2 -1.0 -.6 -3.7 -5.3 -1.4 -4.1 -.1 -.7 -1.8 -2.2 -2.5 -1.7 -3.1 -1.7
-2.2 -.7 -.3 -.4 -.9 -2.2 -4.6 -6.3 -6.9 -4.4 -2.6 -1.3 -.6 1.2 .8 -.1 -4.7 -5.9 -3.5 -2.8 -1.1 -3.1 -1.3 .6 -1.8 -4.5 -5.3 -7.5 -4.2 -4.3 -6.8 -7.9 -7.0 -6.6 -4.4 -4.5
-5.5 -3.8 -2.3 -2.0 -1.2 -1.4 -2.1 -3.5 -2.7 -3.5 -6.7 -5.6 -2.5 -1.1 -4.2 -3.9 -3.2 -1.1 -2.8 -6.0 -6.5 -3.8 .1 -1.6 -6.7 -9.2 -8.0 -8.2 -3.2 -4.2 -4.2 -4.5 -5.7 -4.5 -5.2 -6.0
-2.4 .3 1.8 2.3 2.6 2.3 2.1 1.7 1.3 .8 -2.4 -4.8 -1.1 .0 1.0 2.2 2.8 3.5 2.4 .4 -2.0 .0 1.2 -1.0 -5.8 -6.2 -9.9 -6.6 -3.5 -1.0 -.5 -3.2 -4.6 -6.9 -7.2 -4.5
-1.0 .1 .7 1.4 2.0 1.9 1.9 1.8 1.6 1.5 .3 -1.4 -.8 .0 .9 1.6 1.8 2.1 2.1 2.2 2.4 1.2 1.6 2.1 1.8 1.2 -.3 .3 1.1 1.3 .8 .5 .2 -1.6 -3.3 -3.5
-.1 -2.1 -3.5 -5.3 -3.9 -1.6 -.2 -.2 .3 .7 .9 1.6 -.2 -.7 -.1 -.3 .6 1.6 1.5 2.2 1.9 1.5 1.5 1.9 1.7 1.5 .8 1.0 .8 .8 -.8 -.9 .0 -.3 -1.2 -1.6
-2.4 -3.1 -2.9 -4.0 -5.8 -5.8 -4.6 -3.5 -3.9 -3.6 -4.1 -5.2 -4.2 -4.5 -3.6 -3.7 -2.4 -1.4 .0 .4 .3 .3 .0 .7 .8 .6 .3 .0 -.9 -.8 -.5 -.4 -.9 -1.9 -2.4 -2.0
-1.8 -2.5 -2.9 -2.7 -2.6 -3.2 -2.8 -2.2 -2.1 -3.0 -4.4 -4.8 -4.5 -4.0 -4.9 -5.8 -4.6 -5.1 -4.7 -4.0 -3.2 -2.5 -2.5 -2.8 -2.8 -3.5 -3.6 -2.9 -3.0 -2.7 -1.8 -.6 -.6 -1.2 -1.3 -.7
-2.2 -2.7 -3.4 -3.0 -3.6 -2.6 -2.4 -2.6 -2.1 -1.9 -3.0 -3.3 -3.4 -3.8 -4.0 -5.3 -4.9 -5.3 -5.9 -5.2 -4.9 -4.5 -4.6 -4.7 -4.4 -5.0 -5.0 -4.7 -5.0 -5.6 -5.7 -4.1 -3.4 -2.7 -2.1 -2.2
-4.4 -4.2 -4.7 -4.3 -5.0 -5.3 -4.0 -3.1 -3.3 -3.1 -2.5 -4.1 -4.8 -4.2 -4.9 -4.3 -4.2 -5.2 -5.3 -5.8 -5.7 -5.4 -5.0 -4.0 -3.2 -2.9 -3.5 -4.2 -5.7 -7.1 -7.6 -6.0 -5.0 -4.2 -4.3 -4.2
-4.7 -5.8 -6.9 -6.7 -6.5 -6.5 -6.6 -6.6 -5.2 -4.4 -4.9 -5.2 -5.8 -4.9 -4.6 -2.8 -3.7 -3.6 -3.0 -2.9 -3.1 -1.9 -.1 .2 -.5 -.4 .8 1.5 -.6 -.7 -1.0 -.3 -.5 -1.1 -2.3 -4.5
-4.4 -5.2 -5.7 -4.9 -4.1 -3.7 -2.9 -1.0 -.4 -1.7 -2.4 -3.6 -3.6 -2.9 -1.6 -.7 -1.1 -1.6 -1.8 -1.5 -1.9 -1.6 -.5 .3 .9 1.9 1.2 1.0 .8 .7 .3 .1 -.2 .3 -2.4 -3.7

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). JULY 2001

Channel: HIRS15 (700 hPa)

NOAA16, using all observations

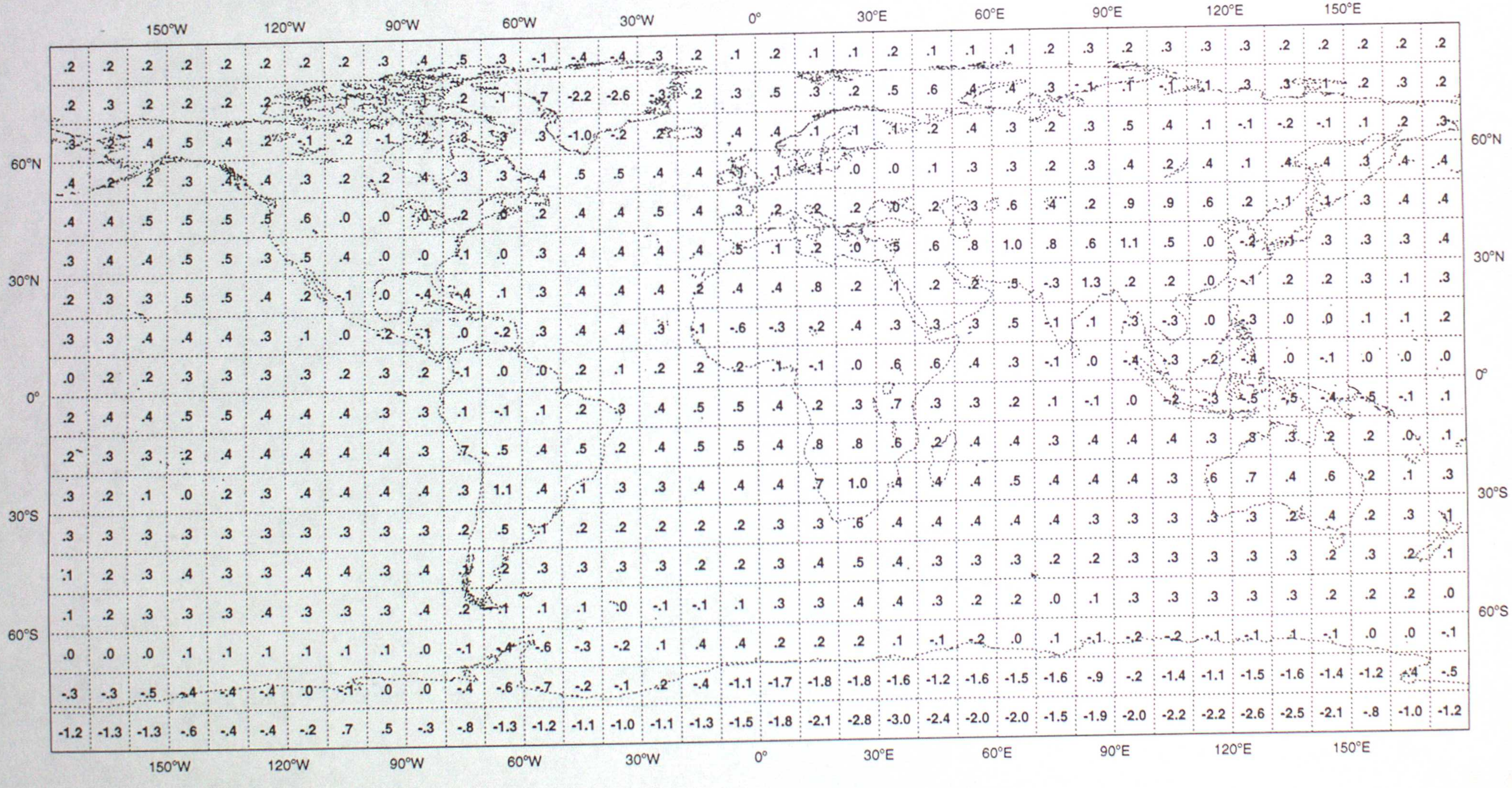


-1.2	-1.5	-1.5	-1.4	-1.3	-1.2	-1.0	-1.0	-1.1	-1.3	-.8	-1.0	-1.2	-1.2	-1.0	-1.0	-1.0	-.9	-.9	-.9	-.6	-.6	-.7	-.7	-.7	-.8	-.9	-1.0	-.7	-.8	-1.0	-1.1	-1.2	-1.0	-1.0	-1.0
-.9	-1.2	-1.5	-1.2	-1.0	-1.3	-2.0	-1.8	-1.9	-2.1	-1.4	-1.1	-1.0	-1.2	-1.0	-.5	-.8	-1.1	-1.6	-1.9	-1.8	-1.6	-1.2	-1.2	-.9	-1.2	-1.7	-2.2	-2.6	-2.0	-1.5	-1.5	-1.7	-1.3	-1.2	-1.1
-1.8	-2.4	-3.6	-3.5	-3.2	-3.1	-3.0	-3.2	-2.7	-1.2	-.6	-.3	-.5	-.7	-1.1	-1.8	-2.2	-2.1	-2.4	-3.3	-2.8	-2.1	-1.7	-2.1	-2.4	-2.5	-2.9	-3.2	-3.0	-2.8	-2.8	-3.2	-2.8	-2.2	-1.8	-1.4
-3.7	-3.7	-3.8	-3.3	-2.1	-3.3	-4.0	-3.8	-2.6	-1.7	-2.6	-3.3	-2.9	-2.8	-3.0	-2.7	-2.6	-3.0	-2.4	-3.0	-3.1	-2.4	-1.5	-1.4	-2.5	-3.2	-3.9	-4.8	-5.2	-4.9	-4.7	-3.4	-1.7	-2.3	-2.4	-2.8
-4.9	-4.5	-2.3	-1.6	-1.4	-.8	-2.8	-5.0	-4.7	-2.8	-2.8	-3.7	-4.9	-3.5	-2.9	-2.1	-1.6	-1.9	-2.6	-2.1	-1.9	-.6	-1.6	-1.6	-.6	-2.9	-4.8	-3.3	-3.6	-3.4	-3.8	-3.7	-3.0	-3.3	-4.5	-4.6
-4.1	-3.0	-1.8	-.8	-.4	-.1	-1.3	-3.3	-2.5	-3.0	-4.5	-5.5	-2.4	-.4	-.1	-.1	-.1	-.6	-.6	.4	.6	.9	.2	.2	.8	-1.5	-.8	-.4	-1.9	-2.6	-1.8	-1.4	-1.7	-3.3	-3.5	-2.8
-3.5	-2.2	-1.3	-1.1	-.6	-.5	-.9	-5.5	2.1	-4.2	-3.1	-2.4	-.9	-.5	-.5	-.4	-.4	-.5	1.1	2.1	.8	.3	-.6	-.5	-1.8	-4.8	-.6	-5.2	-2.2	-2.2	-2.6	-2.8	-2.9	-2.9	-4.3	-3.5
-3.7	-2.5	-1.9	-2.0	-2.4	-3.8	-5.5	-7.5	-7.5	-5.1	-3.4	-2.9	-2.2	-.7	-1.1	-1.9	-5.2	-6.7	-4.7	-4.7	-3.1	-5.3	-3.2	-.9	-2.8	-6.2	-5.8	-8.1	-4.9	-4.7	-7.0	-7.9	-7.1	-7.2	-5.3	-6.2
-6.7	-5.4	-4.2	-3.8	-3.5	-3.3	-4.0	-5.7	-4.6	-5.7	-8.7	-7.3	-4.5	-3.5	-6.5	-6.0	-4.8	-2.8	-4.6	-8.4	-8.6	-5.0	-1.3	-2.7	-7.7	-10.3	-9.1	-8.8	-4.0	-4.7	-5.6	-6.0	-7.5	-5.9	-6.4	-7.3
-3.0	-1.2	-.3	.0	-.1	-.2	-.3	-.4	-.6	-1.0	-4.8	-5.7	-2.3	-1.1	-.9	-.3	-.1	.1	-.5	-1.7	-3.4	-.7	-.8	-2.9	-7.3	-7.6	-10.9	-7.9	-4.3	-2.4	-2.5	-5.3	-6.8	-8.5	-8.1	-5.4
-2.5	-1.7	-1.3	-.8	-.2	-.1	-.3	-.3	-.5	-.7	-1.1	-2.4	-1.3	-.5	-.9	-.6	-.4	-.2	-.6	.9	.7	-.4	-.4	-.5	-.9	-1.4	-2.3	-2.2	-.9	-.8	-.6	-.5	-.8	-3.3	-4.7	-5.1
-2.6	-4.6	-6.2	-7.7	-5.8	-3.1	-1.8	-2.0	-1.6	-1.3	-.8	.2	-2.1	-2.7	-2.2	-2.5	-1.3	-.5	-.5	.8	.9	-.3	-.4	-.4	-.6	-1.2	-2.0	-1.1	-1.3	-.1	-1.8	-2.2	-.7	-1.6	-3.5	-4.1
-4.4	-4.8	-4.6	-5.2	-7.1	-6.9	-6.1	-5.1	-5.4	-5.2	-5.2	-4.9	-4.9	-6.1	-5.5	-5.3	-4.3	-3.2	-2.0	-1.6	-1.2	-1.7	-2.3	-1.6	-1.4	-1.5	-1.6	-1.7	-2.6	-2.5	-1.9	-1.8	-1.9	-3.8	-4.4	-3.6
-3.5	-3.7	-3.8	-3.4	-3.3	-3.7	-3.3	-2.8	-3.1	-3.8	-4.8	-4.8	-4.9	-4.7	-5.3	-6.0	-4.8	-5.5	-5.4	-4.9	-4.2	-3.5	-3.6	-4.0	-4.0	-4.5	-4.7	-4.1	-4.1	-4.0	-3.4	-2.4	-2.2	-2.6	-2.8	-2.2
-3.5	-3.2	-3.4	-3.2	-4.0	-3.4	-3.1	-3.3	-3.2	-2.9	-3.7	-3.4	-3.3	-3.4	-3.4	-4.4	-4.2	-4.6	-5.1	-4.9	-4.8	-4.5	-4.5	-4.7	-4.3	-4.5	-4.5	-4.4	-4.8	-5.5	-5.8	-4.7	-4.1	-3.6	-3.4	-3.7
-3.4	-3.1	-3.5	-3.4	-4.6	-5.0	-4.0	-3.4	-3.6	-3.3	-2.6	-3.1	-3.2	-2.5	-2.9	-2.6	-2.6	-3.4	-3.7	-4.3	-4.2	-4.0	-3.6	-2.6	-1.9	-1.7	-2.2	-2.9	-4.1	-5.5	-5.9	-4.7	-3.8	-2.9	-2.9	-3.3
-2.7	-3.6	-4.4	-4.4	-4.3	-4.4	-4.4	-4.4	-3.2	-2.6	-2.7	-2.5	-2.8	-2.4	-2.3	-1.6	-1.8	-1.5	-1.3	-1.3	-1.3	-.6	.2	.4	.0	.1	.5	.7	-.1	-.2	-.2	.3	.4	.2	-.8	-2.3
-1.8	-2.5	-3.0	-2.4	-1.8	-1.5	-1.1	.0	.2	-.2	-.5	-.8	-.6	-.2	.2	.5	.3	.1	-.1	-.1	-.2	.2	.6	.8	1.0	1.2	1.1	1.0	.8	.8	.7	.7	.6	.6	-.8	-1.4

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2001

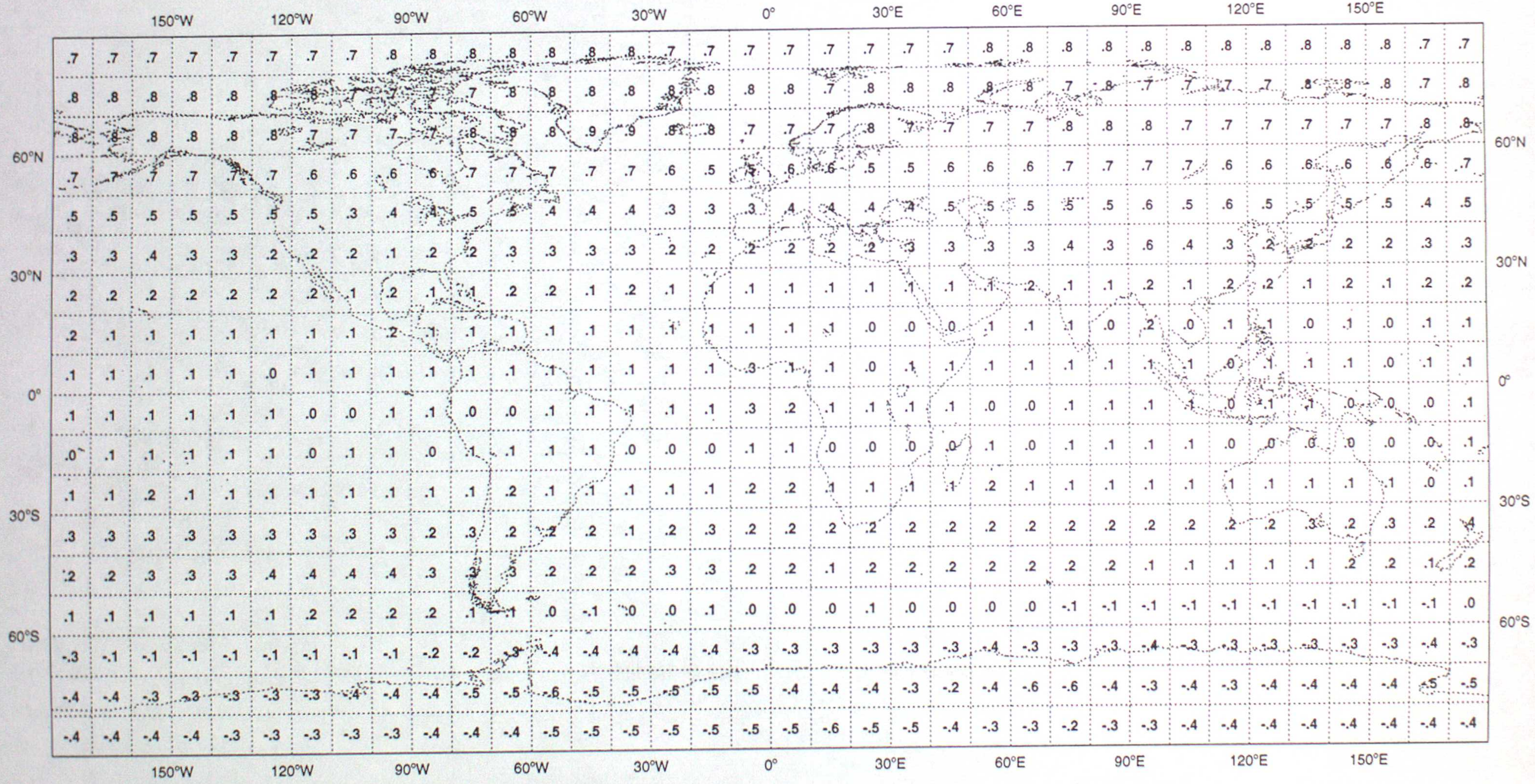
Channel: HIRS11 (500 - 700 hPa)

NOAA16, using all observations



.2	.2	.2	.2	.2	.2	.2	.2	.3	.4	.5	.3	-.1	-.4	-.4	.3	.2	.1	.2	.1	.1	.2	.1	.1	.1	.2	.3	.2	.3	.3	.3	.2	.2	.2	.2	.2
.2	.3	.2	.2	.2	.2	.6	.1	.1	.1	.2	.1	.7	-2.2	-2.6	-.3	.2	.3	.5	.3	.2	.5	.6	.4	.4	.3	-.1	.1	-.1	.1	.3	.3	.1	.2	.3	.2
.3	.2	.4	.5	.4	.2	-.1	-.2	-.1	.2	.3	.3	.3	-1.0	-.2	.2	.3	.4	.4	.1	.1	.1	.2	.4	.3	.2	.3	.5	.4	.1	-.1	-.2	-.1	.1	.2	.3
.4	.2	.2	.3	.4	.4	.3	.2	.2	.4	.3	.3	.4	.5	.5	.4	.4	.1	.1	.1	.0	.0	.1	.3	.3	.2	.3	.4	.2	.4	.1	.4	.4	.3	.4	.4
.4	.4	.5	.5	.5	.5	.6	.0	.0	.0	.2	.6	.2	.4	.4	.5	.4	.3	.2	.2	.2	.0	.2	.3	.6	.4	.2	.9	.9	.6	.2	.1	.1	.3	.4	.4
.3	.4	.4	.5	.5	.3	.5	.4	.0	.0	.1	.0	.3	.4	.4	.4	.4	.5	.1	.2	.0	.5	.6	.8	1.0	.8	.6	1.1	.5	.0	-.2	-.1	.3	.3	.3	.4
.2	.3	.3	.5	.5	.4	.2	-.1	.0	-.4	-.4	.1	.3	.4	.4	.4	.2	.4	.4	.8	.2	.1	.2	.2	.5	-.3	1.3	.2	.2	.0	-.1	.2	.2	.3	.1	.3
.3	.3	.4	.4	.4	.3	.1	.0	-.2	-.1	.0	-.2	.3	.4	.4	.3	.1	-.6	-.3	-.2	.4	.3	.3	.3	.5	-.1	.1	-.3	-.3	.0	-.3	.0	.0	.1	.1	.2
.0	.2	.2	.3	.3	.3	.3	.2	.3	.2	-.1	.0	.0	.2	.1	.2	.2	.2	.1	-.1	.0	.6	.6	.4	.3	-.1	.0	-.4	-.3	-.2	-.4	.0	-.1	.0	.0	.0
.2	.4	.4	.5	.5	.4	.4	.4	.3	.3	.1	-.1	.1	.2	.3	.4	.5	.5	.4	.2	.3	.7	.3	.3	.2	.1	-.1	.0	-.2	-.3	-.5	-.5	-.4	-.5	-.1	.1
.2	.3	.3	.2	.4	.4	.4	.4	.4	.3	.7	.5	.4	.5	.2	.4	.5	.5	.4	.8	.8	.6	.2	.4	.4	.3	.4	.4	.4	.3	.3	.3	.2	.2	.0	.1
.3	.2	.1	.0	.2	.3	.4	.4	.4	.4	.3	1.1	.4	.1	.3	.3	.4	.4	.4	.7	1.0	.4	.4	.4	.5	.4	.4	.4	.3	.6	.7	.4	.6	.2	.1	.3
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.2	.5	.1	.2	.2	.2	.2	.2	.3	.3	.6	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.2	.4	.2	.3	.1
.1	.2	.3	.4	.3	.3	.4	.4	.3	.4	.1	.2	.3	.3	.3	.3	.2	.2	.3	.4	.5	.4	.3	.3	.3	.2	.2	.3	.3	.3	.3	.3	.2	.3	.2	.1
.1	.2	.3	.3	.3	.4	.3	.3	.3	.4	.2	.1	.1	.1	.0	-.1	-.1	.1	.3	.3	.4	.4	.3	.2	.2	.0	.1	.3	.3	.3	.3	.3	.2	.2	.2	.0
.0	.0	.0	.1	.1	.1	.1	.1	.1	.0	-.1	.4	-.6	-.3	-.2	.1	.4	.4	.2	.2	.2	.1	-.1	-.2	.0	.1	-.1	-.2	-.2	-.1	-.1	.1	-.1	.0	.0	-.1
-.3	-.3	-.5	-.4	-.4	-.4	.0	-.1	.0	.0	-.4	-.6	-.7	-.2	-.1	.2	-.4	-1.1	-1.7	-1.8	-1.8	-1.6	-1.2	-1.6	-1.5	-1.6	-.9	-.2	-1.4	-1.1	-1.5	-1.6	-1.4	-1.2	-.4	-.5
-1.2	-1.3	-1.3	-.6	-.4	-.4	-.2	.7	.5	-.3	-.8	-1.3	-1.2	-1.1	-1.0	-1.1	-1.3	-1.5	-1.8	-2.1	-2.8	-3.0	-2.4	-2.0	-2.0	-1.5	-1.9	-2.0	-2.2	-2.2	-2.6	-2.5	-2.1	-.8	-1.0	-1.2

Figure 46. ATOVS SD O-B brightness temperature differences (deg C). JULY 2001
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



.7	.7	.7	.7	.7	.7	.7	.7	.8	.8	.8	.8	.8	.8	.8	.7	.7	.7	.7	.7	.7	.7	.7	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.7	.7
.8	.8	.8	.8	.8	.8	.8	.7	.7	.7	.7	.8	.8	.8	.8	.8	.8	.8	.8	.7	.8	.8	.8	.8	.8	.7	.8	.7	.7	.7	.7	.8	.8	.8	.7	.8
.8	.8	.8	.8	.8	.8	.7	.7	.7	.7	.8	.8	.8	.9	.9	.8	.8	.7	.7	.7	.8	.7	.7	.7	.7	.8	.8	.8	.7	.7	.7	.7	.7	.7	.8	.8
.7	.7	.7	.7	.7	.7	.6	.6	.6	.6	.7	.7	.7	.7	.7	.6	.5	.5	.6	.6	.5	.5	.6	.6	.6	.7	.7	.7	.7	.6	.6	.6	.6	.6	.6	.7
.5	.5	.5	.5	.5	.5	.5	.3	.4	.4	.5	.5	.4	.4	.4	.3	.3	.3	.4	.4	.4	.4	.5	.5	.5	.5	.5	.6	.5	.6	.5	.5	.5	.5	.4	.5
.3	.3	.4	.3	.3	.2	.2	.2	.1	.2	.2	.3	.3	.3	.3	.2	.2	.2	.2	.2	.2	.3	.3	.3	.3	.4	.3	.6	.4	.3	.2	.2	.2	.2	.3	.3
.2	.2	.2	.2	.2	.2	.2	.1	.2	.1	.1	.2	.2	.1	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	.2	.1	.1	.2	.1	.2	.2	.1	.2	.1	.2	.2
.2	.1	.1	.1	.1	.1	.1	.1	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.0	.0	.0	.1	.1	.1	.0	.2	.0	.1	.1	.0	.1	.0	.1	.1
.1	.1	.1	.1	.1	.0	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.3	.1	.1	.0	.1	.1	.1	.1	.1	.1	.1	.1	.0	.1	.1	.1	.0	.1	.1
.1	.1	.1	.1	.1	.1	.0	.0	.1	.1	.0	.0	.1	.1	.1	.1	.1	.3	.2	.1	.1	.1	.1	.0	.0	.1	.1	.1	.1	.0	.1	.1	.0	.0	.0	.1
.0	.1	.1	.1	.1	.1	.0	.1	.1	.0	.1	.1	.1	.1	.0	.0	.0	.1	.1	.0	.0	.0	.0	.1	.0	.1	.1	.1	.1	.0	.0	.0	.0	.0	.0	.1
.1	.1	.2	.1	.1	.1	.1	.1	.1	.1	.1	.2	.1	.1	.1	.1	.1	.2	.2	.1	.1	.1	.1	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.0	.1
.3	.3	.3	.3	.3	.3	.3	.3	.3	.2	.3	.2	.2	.2	.1	.2	.3	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.3	.2	.3	.2	.4
.2	.2	.3	.3	.3	.4	.4	.4	.4	.3	.3	.3	.2	.2	.2	.3	.3	.2	.2	.1	.2	.2	.2	.2	.2	.2	.2	.1	.1	.1	.1	.1	.2	.2	.1	.2
.1	.1	.1	.1	.1	.1	.2	.2	.2	.2	.1	.1	.0	-.1	.0	.0	.1	.0	.0	.0	.1	.0	.0	.0	.0	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	.0
-.3	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.2	-.2	-.3	-.4	-.4	-.4	-.4	-.4	-.3	-.3	-.3	-.3	-.3	-.3	-.4	-.3	-.3	-.3	-.4	-.3	-.3	-.3	-.3	-.3	-.3	-.4	-.3
-.4	-.4	-.3	-.3	-.3	-.3	-.3	-.4	-.4	-.4	-.5	-.5	-.6	-.5	-.5	-.5	-.5	-.5	-.4	-.4	-.4	-.3	-.2	-.4	-.6	-.6	-.4	-.3	-.4	-.3	-.4	-.4	-.4	-.4	-.5	-.5
-.4	-.4	-.4	-.4	-.3	-.3	-.3	-.3	-.3	-.4	-.4	-.4	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.6	-.5	-.5	-.4	-.3	-.3	-.2	-.3	-.3	-.4	-.4	-.4	-.4	-.4	-.4	-.4	-.4

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2001

Channel: HIRS4 (400 hPa)

NOAA16, using all observations

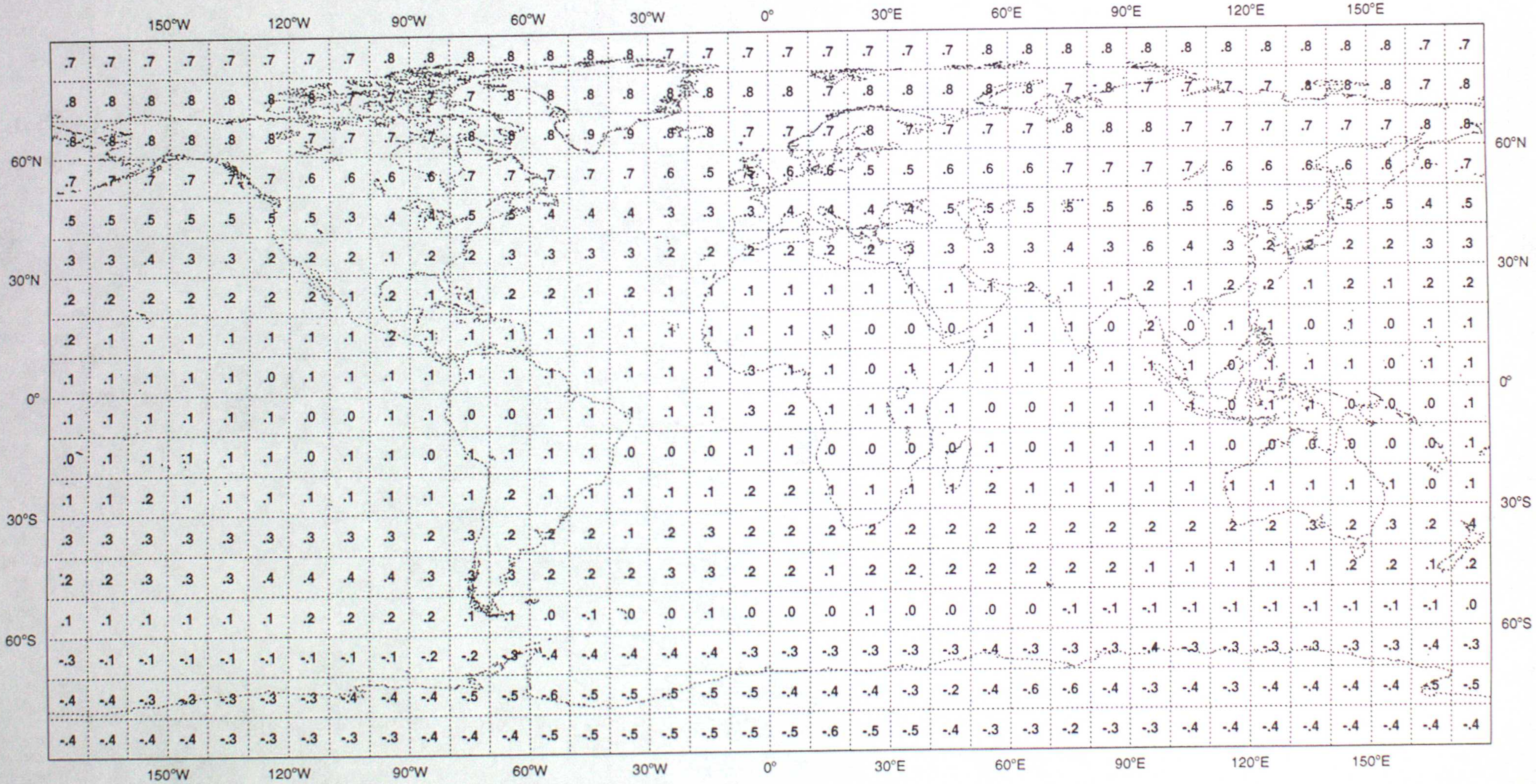
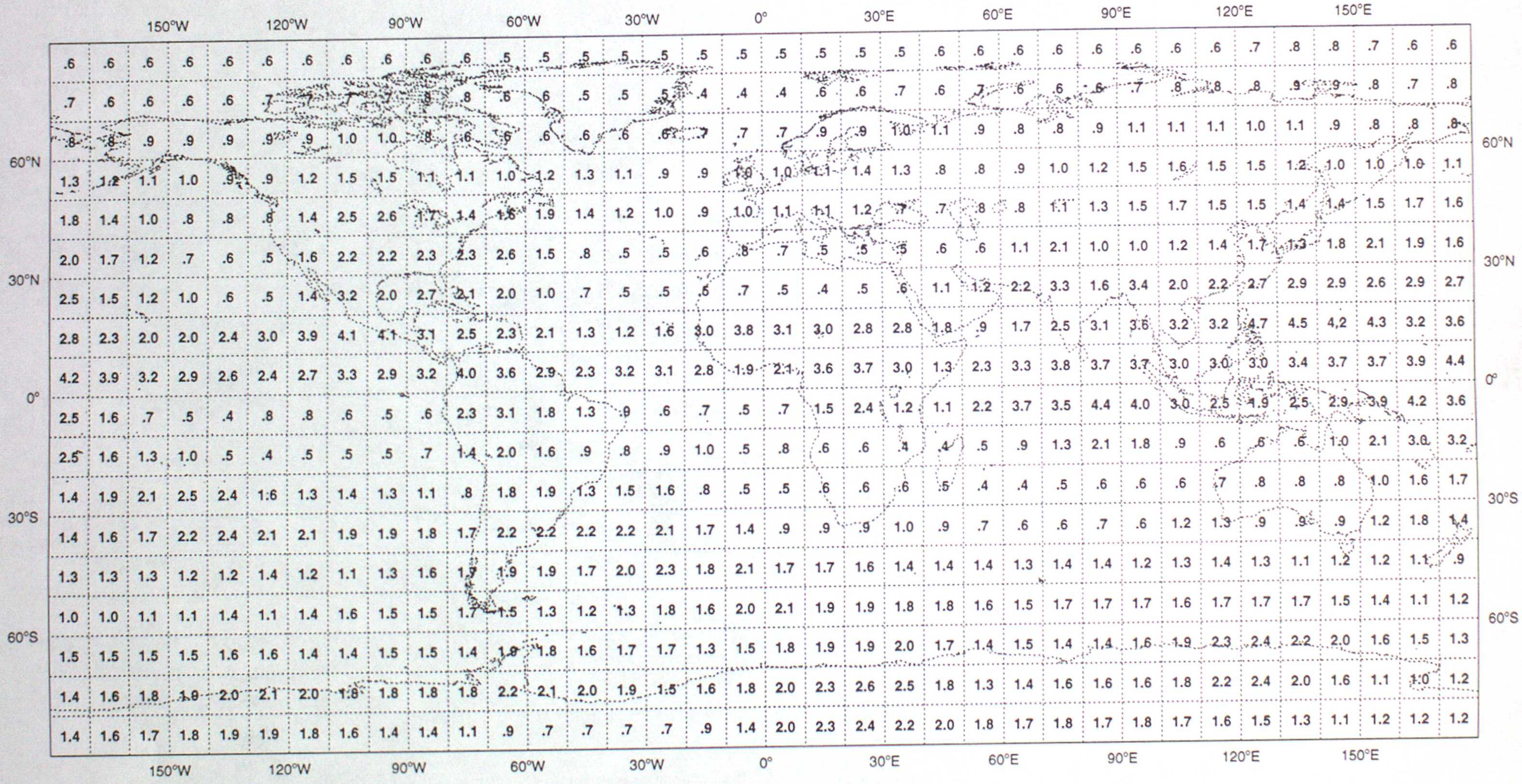

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
.7 .7 .7 .7 .7 .7 .7 .7 .8 .8 .8 .8 .8 .8 .8 .7 .7 .7 .7 .7 .7 .7 .7 .8 .8 .8 .8 .8 .8 .8 .8 .8 .8 .8 .7 .7
.8 .8 .8 .8 .8 .8 .8 .7 .7 .7 .7 .8 .8 .8 .8 .8 .8 .8 .8 .7 .8 .8 .8 .8 .8 .7 .8 .7 .7 .7 .7 .8 .8 .8 .7 .8
.8 .8 .8 .8 .8 .8 .7 .7 .7 .7 .8 .8 .8 .9 .9 .8 .8 .7 .7 .7 .8 .7 .7 .7 .7 .8 .8 .8 .7 .7 .7 .7 .7 .7 .8 .8
.7 .7 .7 .7 .7 .7 .6 .6 .6 .6 .7 .7 .7 .7 .7 .6 .5 .5 .6 .6 .5 .5 .6 .6 .6 .7 .7 .7 .7 .6 .6 .6 .6 .6 .6 .7
.5 .5 .5 .5 .5 .5 .5 .3 .4 .4 .5 .5 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .5 .5 .5 .5 .5 .6 .5 .6 .5 .5 .5 .5 .4 .5
.3 .3 .4 .3 .3 .2 .2 .2 .1 .2 .2 .3 .3 .3 .3 .2 .2 .2 .2 .2 .2 .3 .3 .3 .3 .4 .3 .6 .4 .3 .2 .2 .2 .2 .3 .3
.2 .2 .2 .2 .2 .2 .2 .1 .2 .1 .1 .2 .2 .1 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .2 .1 .1 .2 .1 .2 .2 .1 .2 .1 .2 .2
.2 .1 .1 .1 .1 .1 .1 .1 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .0 .0 .0 .1 .1 .1 .0 .2 .0 .1 .1 .0 .1 .0 .1 .1
.1 .1 .1 .1 .1 .0 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .3 .1 .1 .0 .1 .1 .1 .1 .1 .1 .1 .1 .0 .1 .1 .1 .0 .1 .1
.1 .1 .1 .1 .1 .1 .0 .0 .1 .1 .0 .0 .1 .1 .1 .1 .1 .3 .2 .1 .1 .1 .1 .0 .0 .1 .1 .1 .1 .0 .1 .1 .0 .0 .0 .1
.0 .1 .1 .1 .1 .1 .0 .1 .1 .0 .1 .1 .1 .1 .0 .0 .0 .1 .1 .0 .0 .0 .0 .1 .0 .1 .1 .1 .1 .0 .0 .0 .0 .0 .0 .1
.1 .1 .2 .1 .1 .1 .1 .1 .1 .1 .1 .2 .1 .1 .1 .1 .1 .2 .2 .1 .1 .1 .1 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .0 .1
.3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .3 .2 .2 .2 .1 .2 .3 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .2 .3 .2 .4
.2 .2 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .2 .2 .2 .3 .3 .2 .2 .1 .2 .2 .2 .2 .2 .2 .2 .1 .1 .1 .1 .1 .2 .2 .1 .2
.1 .1 .1 .1 .1 .1 .2 .2 .2 .2 .1 .1 .0 -.1 .0 .0 .1 .0 .0 .0 .1 .0 .0 .0 .0 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 .0
-.3 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.2 -.2 -.3 -.4 -.4 -.4 -.4 -.4 -.3 -.3 -.3 -.3 -.3 -.3 -.4 -.3 -.3 -.3 -.4 -.3 -.3 -.3 -.3 -.3 -.3 -.4 -.3
-.4 -.4 -.3 -.3 -.3 -.3 -.3 -.4 -.4 -.4 -.5 -.5 -.6 -.5 -.5 -.5 -.5 -.5 -.4 -.4 -.4 -.3 -.2 -.4 -.6 -.6 -.4 -.3 -.4 -.3 -.4 -.4 -.4 -.4 -.5 -.5
-.4 -.4 -.4 -.4 -.3 -.3 -.3 -.3 -.3 -.4 -.4 -.4 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.5 -.6 -.5 -.5 -.4 -.3 -.3 -.2 -.3 -.3 -.4 -.4 -.4 -.4 -.4 -.4

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). JULY 2001
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

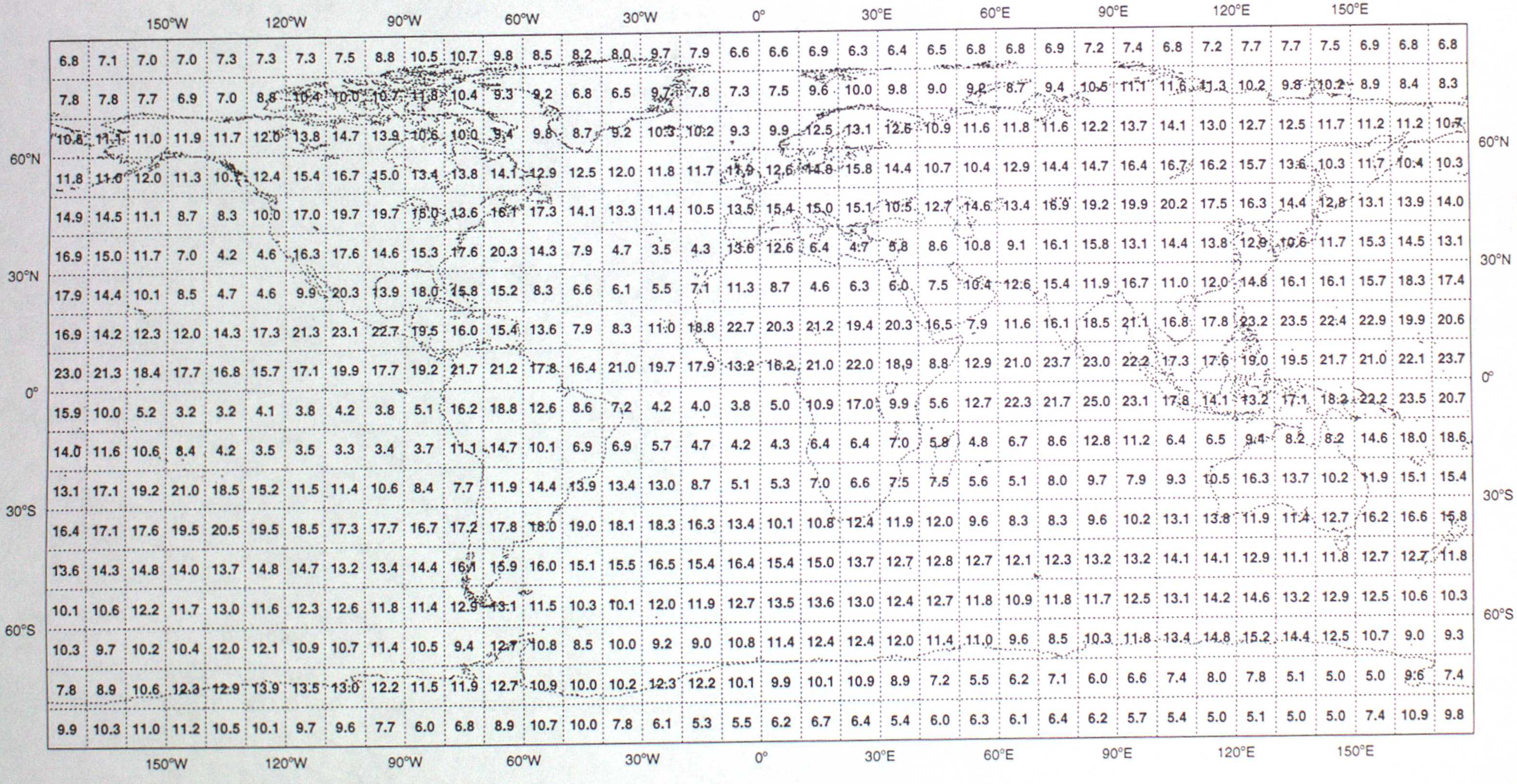


.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.6	.6	.6	.6	.6	.7	.8	.8	.7	.6	.6
.7	.6	.6	.6	.6	.7	.7	.7	.7	.8	.8	.6	.6	.5	.5	.5	.4	.4	.4	.6	.6	.7	.6	.7	.6	.6	.6	.7	.8	.8	.8	.9	.9	.8	.7	.8
.8	.8	.9	.9	.9	.9	.9	1.0	1.0	.8	.6	.6	.6	.6	.6	.6	.7	.7	.7	.9	.9	1.0	1.1	.9	.8	.8	.9	1.1	1.1	1.1	1.0	1.1	.9	.8	.8	.8
1.3	1.2	1.1	1.0	.9	.9	1.2	1.5	1.5	1.1	1.1	1.0	1.2	1.3	1.1	.9	.9	1.0	1.0	1.1	1.4	1.3	.8	.8	.9	1.0	1.2	1.5	1.6	1.5	1.5	1.2	1.0	1.0	1.0	1.1
1.8	1.4	1.0	.8	.8	.8	1.4	2.5	2.6	1.7	1.4	1.6	1.9	1.4	1.2	1.0	.9	1.0	1.1	1.1	1.2	.7	.7	.8	.8	1.1	1.3	1.5	1.7	1.5	1.5	1.4	1.4	1.5	1.7	1.6
2.0	1.7	1.2	.7	.6	.5	1.6	2.2	2.2	2.3	2.3	2.6	1.5	.8	.5	.5	.6	.8	.7	.5	.5	.5	.6	.6	1.1	2.1	1.0	1.0	1.2	1.4	1.7	1.3	1.8	2.1	1.9	1.6
2.5	1.5	1.2	1.0	.6	.5	1.4	3.2	2.0	2.7	2.1	2.0	1.0	.7	.5	.5	.5	.7	.5	.4	.5	.6	1.1	1.2	2.2	3.3	1.6	3.4	2.0	2.2	2.7	2.9	2.9	2.6	2.9	2.7
2.8	2.3	2.0	2.0	2.4	3.0	3.9	4.1	4.1	3.1	2.5	2.3	2.1	1.3	1.2	1.6	3.0	3.8	3.1	3.0	2.8	2.8	1.8	.9	1.7	2.5	3.1	3.6	3.2	3.2	4.7	4.5	4.2	4.3	3.2	3.6
4.2	3.9	3.2	2.9	2.6	2.4	2.7	3.3	2.9	3.2	4.0	3.6	2.9	2.3	3.2	3.1	2.8	1.9	2.1	3.6	3.7	3.0	1.3	2.3	3.3	3.8	3.7	3.7	3.0	3.0	3.0	3.4	3.7	3.7	3.9	4.4
2.5	1.6	.7	.5	.4	.8	.8	.6	.5	.6	2.3	3.1	1.8	1.3	.9	.6	.7	.5	.7	1.5	2.4	1.2	1.1	2.2	3.7	3.5	4.4	4.0	3.0	2.5	1.9	2.5	2.9	3.9	4.2	3.6
2.5	1.6	1.3	1.0	.5	.4	.5	.5	.5	.7	1.4	2.0	1.6	.9	.8	.9	1.0	.5	.8	.6	.6	.4	.4	.5	.9	1.3	2.1	1.8	.9	.6	.6	.6	1.0	2.1	3.0	3.2
1.4	1.9	2.1	2.5	2.4	1.6	1.3	1.4	1.3	1.1	.8	1.8	1.9	1.3	1.5	1.6	.8	.5	.5	.6	.6	.6	.5	.4	.4	.5	.6	.6	.6	.7	.8	.8	.8	1.0	1.6	1.7
1.4	1.6	1.7	2.2	2.4	2.1	2.1	1.9	1.9	1.8	1.7	2.2	2.2	2.2	2.2	2.1	1.7	1.4	.9	.9	.9	1.0	.9	.7	.6	.6	.7	.6	1.2	1.3	.9	.9	.9	1.2	1.8	1.4
1.3	1.3	1.3	1.2	1.2	1.4	1.2	1.1	1.3	1.6	1.7	1.9	1.9	1.7	2.0	2.3	1.8	2.1	1.7	1.7	1.6	1.4	1.4	1.4	1.3	1.4	1.4	1.2	1.3	1.4	1.3	1.1	1.2	1.2	1.1	.9
1.0	1.0	1.1	1.1	1.4	1.1	1.4	1.6	1.5	1.5	1.7	1.5	1.3	1.2	1.3	1.8	1.6	2.0	2.1	1.9	1.9	1.8	1.8	1.6	1.5	1.7	1.7	1.7	1.6	1.7	1.7	1.7	1.5	1.4	1.1	1.2
1.5	1.5	1.5	1.5	1.6	1.6	1.4	1.4	1.5	1.5	1.4	1.9	1.8	1.6	1.7	1.7	1.3	1.5	1.8	1.9	1.9	2.0	1.7	1.4	1.5	1.4	1.4	1.6	1.9	2.3	2.4	2.2	2.0	1.6	1.5	1.3
1.4	1.6	1.8	1.9	2.0	2.1	2.0	1.8	1.8	1.8	1.8	2.2	2.1	2.0	1.9	1.5	1.6	1.8	2.0	2.3	2.6	2.5	1.8	1.3	1.4	1.6	1.6	1.6	1.8	2.2	2.4	2.0	1.6	1.1	1.0	1.2
1.4	1.6	1.7	1.8	1.9	1.9	1.8	1.6	1.4	1.4	1.1	.9	.7	.7	.7	.7	.9	1.4	2.0	2.3	2.4	2.2	2.0	1.8	1.7	1.8	1.7	1.8	1.7	1.6	1.5	1.3	1.1	1.2	1.2	1.2

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2001

Channel: AMSUA-5 (700 hPa)

NOAA16, using all observations

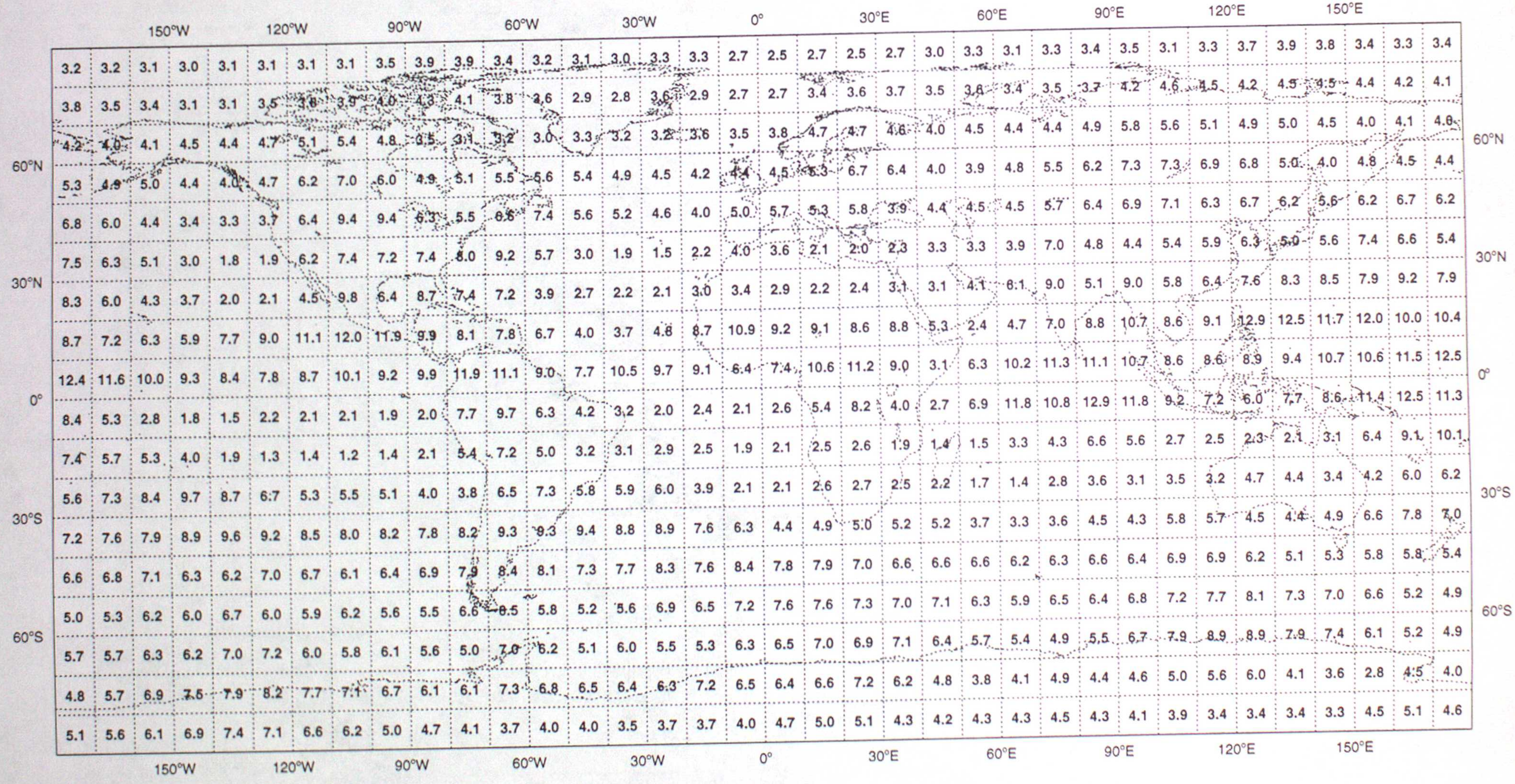


6.8	7.1	7.0	7.0	7.3	7.3	7.3	7.5	8.8	10.5	10.7	9.8	8.5	8.2	8.0	9.7	7.9	6.6	6.6	6.9	6.3	6.4	6.5	6.8	6.8	6.9	7.2	7.4	6.8	7.2	7.7	7.7	7.5	6.9	6.8	6.8
7.8	7.8	7.7	6.9	7.0	8.8	10.4	10.0	10.7	11.8	10.4	9.3	9.2	6.8	6.5	9.7	7.8	7.3	7.5	9.6	10.0	9.8	9.0	9.2	8.7	9.4	10.5	11.1	11.6	11.3	10.2	9.8	10.2	8.9	8.4	8.3
10.6	11.1	11.0	11.9	11.7	12.0	13.8	14.7	13.9	10.6	10.0	9.4	9.8	8.7	9.2	10.3	10.2	9.3	9.9	12.5	13.1	12.6	10.9	11.6	11.8	11.6	12.2	13.7	14.1	13.0	12.7	12.5	11.7	11.2	11.2	10.7
11.8	11.6	12.0	11.3	10.[illegible]	12.4	15.4	16.7	15.0	13.4	13.8	14.1	12.9	12.5	12.0	11.8	11.7	11.9	12.6	14.8	15.8	14.4	10.7	10.4	12.9	14.4	14.7	16.4	16.7	16.2	15.7	13.6	10.3	11.7	10.4	10.3
14.9	14.5	11.1	8.7	8.3	10.0	17.0	19.7	19.7	15.0	13.6	16.1	17.3	14.1	13.3	11.4	10.5	13.5	15.4	15.0	15.1	10.5	12.7	14.6	13.4	16.9	19.2	19.9	20.2	17.5	16.3	14.4	12.8	13.1	13.9	14.0
16.9	15.0	11.7	7.0	4.2	4.6	16.3	17.6	14.6	15.3	17.6	20.3	14.3	7.9	4.7	3.5	4.3	13.6	12.6	6.4	4.7	5.8	8.6	10.8	9.1	16.1	15.8	13.1	14.4	13.8	12.9	10.6	11.7	15.3	14.5	13.1
17.9	14.4	10.1	8.5	4.7	4.6	9.9	20.3	13.9	18.0	15.8	15.2	8.3	6.6	6.1	5.5	7.1	11.3	8.7	4.6	6.3	6.0	7.5	10.4	12.6	15.4	11.9	16.7	11.0	12.0	14.8	16.1	16.1	15.7	18.3	17.4
16.9	14.2	12.3	12.0	14.3	17.3	21.3	23.1	22.7	19.5	16.0	15.4	13.6	7.9	8.3	11.0	18.8	22.7	20.3	21.2	19.4	20.3	16.5	7.9	11.6	16.1	18.5	21.1	16.8	17.8	23.2	23.5	22.4	22.9	19.9	20.6
23.0	21.3	18.4	17.7	16.8	15.7	17.1	19.9	17.7	19.2	21.7	21.2	17.8	16.4	21.0	19.7	17.9	13.2	16.2	21.0	22.0	18.9	8.8	12.9	21.0	23.7	23.0	22.2	17.3	17.6	19.0	19.5	21.7	21.0	22.1	23.7
15.9	10.0	5.2	3.2	3.2	4.1	3.8	4.2	3.8	5.1	16.2	18.8	12.6	8.6	7.2	4.2	4.0	3.8	5.0	10.9	17.0	9.9	5.6	12.7	22.3	21.7	25.0	23.1	17.8	14.1	13.2	17.1	18.2	22.2	23.5	20.7
14.0	11.6	10.6	8.4	4.2	3.5	3.5	3.3	3.4	3.7	11.1	14.7	10.1	6.9	6.9	5.7	4.7	4.2	4.3	6.4	6.4	7.0	5.8	4.8	6.7	8.6	12.8	11.2	6.4	6.5	9.4	8.2	8.2	14.6	18.0	18.6
13.1	17.1	19.2	21.0	18.5	15.2	11.5	11.4	10.6	8.4	7.7	11.9	14.4	13.9	13.4	13.0	8.7	5.1	5.3	7.0	6.6	7.5	7.5	5.6	5.1	8.0	9.7	7.9	9.3	10.5	16.3	13.7	10.2	11.9	15.1	15.4
16.4	17.1	17.6	19.5	20.5	19.5	18.5	17.3	17.7	16.7	17.2	17.8	18.0	19.0	18.1	18.3	16.3	13.4	10.1	10.8	12.4	11.9	12.0	9.6	8.3	8.3	9.6	10.2	13.1	13.8	11.9	11.4	12.7	16.2	16.6	15.8
13.6	14.3	14.8	14.0	13.7	14.8	14.7	13.2	13.4	14.4	16.1	15.9	16.0	15.1	15.5	16.5	15.4	16.4	15.4	15.0	13.7	12.7	12.8	12.7	12.1	12.3	13.2	13.2	14.1	14.1	12.9	11.1	11.8	12.7	12.7	11.8
10.1	10.6	12.2	11.7	13.0	11.6	12.3	12.6	11.8	11.4	12.9	13.1	11.5	10.3	10.1	12.0	11.9	12.7	13.5	13.6	13.0	12.4	12.7	11.8	10.9	11.8	11.7	12.5	13.1	14.2	14.6	13.2	12.9	12.5	10.6	10.3
10.3	9.7	10.2	10.4	12.0	12.1	10.9	10.7	11.4	10.5	9.4	12.7	10.8	8.5	10.0	9.2	9.0	10.8	11.4	12.4	12.4	12.0	11.4	11.0	9.6	8.5	10.3	11.8	13.4	14.8	15.2	14.4	12.5	10.7	9.0	9.3
7.8	8.9	10.6	12.3	12.9	13.9	13.5	13.0	12.2	11.5	11.9	12.7	10.9	10.0	10.2	12.3	12.2	10.1	9.9	10.1	10.9	8.9	7.2	5.5	6.2	7.1	6.0	6.6	7.4	8.0	7.8	5.1	5.0	5.0	9.6	7.4
9.9	10.3	11.0	11.2	10.5	10.1	9.7	9.6	7.7	6.0	6.8	8.9	10.7	10.0	7.8	6.1	5.3	5.5	6.2	6.7	6.4	5.4	6.0	6.3	6.1	6.4	6.2	5.7	5.4	5.0	5.1	5.0	5.0	7.4	10.9	9.8

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). JULY 2001

Channel: AMSUA-5 (700 hPa)

NOAA16, using all observations

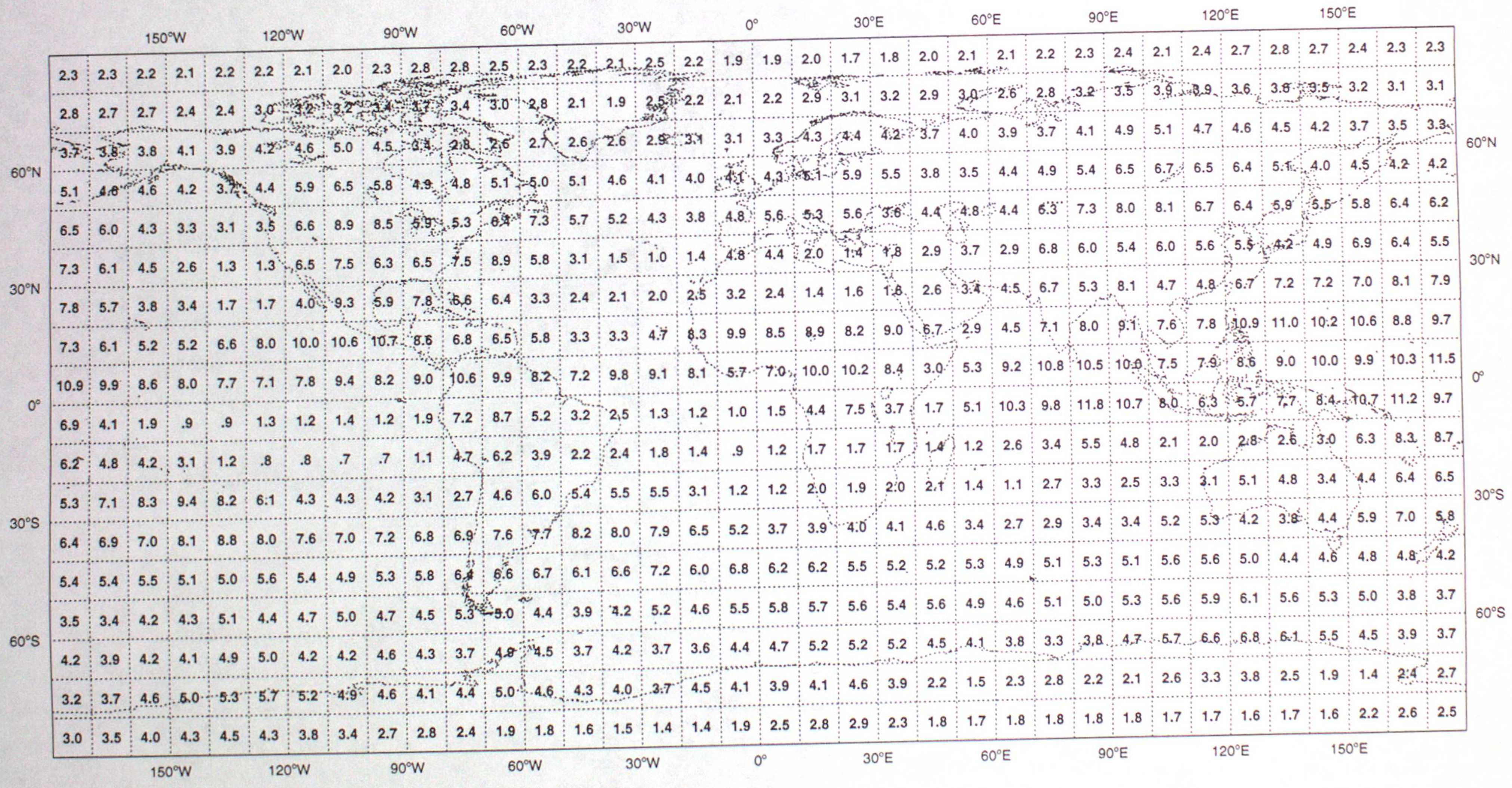


3.2	3.2	3.1	3.0	3.1	3.1	3.1	3.1	3.5	3.9	3.9	3.4	3.2	3.1	3.0	3.3	3.3	2.7	2.5	2.7	2.5	2.7	3.0	3.3	3.1	3.3	3.4	3.5	3.1	3.3	3.7	3.9	3.8	3.4	3.3	3.4
3.8	3.5	3.4	3.1	3.1	3.5	3.8	3.9	4.0	4.3	4.1	3.8	3.6	2.9	2.8	3.6	2.9	2.7	2.7	3.4	3.6	3.7	3.5	3.6	3.4	3.5	3.7	4.2	4.6	4.5	4.2	4.5	4.5	4.4	4.2	4.1
4.2	4.0	4.1	4.5	4.4	4.7	5.1	5.4	4.8	3.5	3.1	3.2	3.0	3.3	3.2	3.2	3.6	3.5	3.8	4.7	4.7	4.6	4.0	4.5	4.4	4.4	4.9	5.8	5.6	5.1	4.9	5.0	4.5	4.0	4.1	4.6
5.3	4.9	5.0	4.4	4.0	4.7	6.2	7.0	6.0	4.9	5.1	5.5	5.6	5.4	4.9	4.5	4.2	4.4	4.5	5.3	6.7	6.4	4.0	3.9	4.8	5.5	6.2	7.3	7.3	6.9	6.8	5.0	4.0	4.8	4.5	4.4
6.8	6.0	4.4	3.4	3.3	3.7	6.4	9.4	9.4	6.3	5.5	6.6	7.4	5.6	5.2	4.6	4.0	5.0	5.7	5.3	5.8	3.9	4.4	4.5	4.5	5.7	6.4	6.9	7.1	6.3	6.7	6.2	5.6	6.2	6.7	6.2
7.5	6.3	5.1	3.0	1.8	1.9	6.2	7.4	7.2	7.4	8.0	9.2	5.7	3.0	1.9	1.5	2.2	4.0	3.6	2.1	2.0	2.3	3.3	3.3	3.9	7.0	4.8	4.4	5.4	5.9	6.3	5.0	5.6	7.4	6.6	5.4
8.3	6.0	4.3	3.7	2.0	2.1	4.5	9.8	6.4	8.7	7.4	7.2	3.9	2.7	2.2	2.1	3.0	3.4	2.9	2.2	2.4	3.1	3.1	4.1	6.1	9.0	5.1	9.0	5.8	6.4	7.6	8.3	8.5	7.9	9.2	7.9
8.7	7.2	6.3	5.9	7.7	9.0	11.1	12.0	11.9	9.9	8.1	7.8	6.7	4.0	3.7	4.8	8.7	10.9	9.2	9.1	8.6	8.8	5.3	2.4	4.7	7.0	8.8	10.7	8.6	9.1	12.9	12.5	11.7	12.0	10.0	10.4
12.4	11.6	10.0	9.3	8.4	7.8	8.7	10.1	9.2	9.9	11.9	11.1	9.0	7.7	10.5	9.7	9.1	6.4	7.4	10.6	11.2	9.0	3.1	6.3	10.2	11.3	11.1	10.7	8.6	8.6	8.9	9.4	10.7	10.6	11.5	12.5
8.4	5.3	2.8	1.8	1.5	2.2	2.1	2.1	1.9	2.0	7.7	9.7	6.3	4.2	3.2	2.0	2.4	2.1	2.6	5.4	8.2	4.0	2.7	6.9	11.8	10.8	12.9	11.8	9.2	7.2	6.0	7.7	8.6	11.4	12.5	11.3
7.4	5.7	5.3	4.0	1.9	1.3	1.4	1.2	1.4	2.1	5.4	7.2	5.0	3.2	3.1	2.9	2.5	1.9	2.1	2.5	2.6	1.9	1.4	1.5	3.3	4.3	6.6	5.6	2.7	2.5	2.3	2.1	3.1	6.4	9.1	10.1
5.6	7.3	8.4	9.7	8.7	6.7	5.3	5.5	5.1	4.0	3.8	6.5	7.3	5.8	5.9	6.0	3.9	2.1	2.1	2.6	2.7	2.5	2.2	1.7	1.4	2.8	3.6	3.1	3.5	3.2	4.7	4.4	3.4	4.2	6.0	6.2
7.2	7.6	7.9	8.9	9.6	9.2	8.5	8.0	8.2	7.8	8.2	9.3	9.3	9.4	8.8	8.9	7.6	6.3	4.4	4.9	5.0	5.2	5.2	3.7	3.3	3.6	4.5	4.3	5.8	5.7	4.5	4.4	4.9	6.6	7.8	7.0
6.6	6.8	7.1	6.3	6.2	7.0	6.7	6.1	6.4	6.9	7.9	8.4	8.1	7.3	7.7	8.3	7.6	8.4	7.8	7.9	7.0	6.6	6.6	6.6	6.2	6.3	6.6	6.4	6.9	6.9	6.2	5.1	5.3	5.8	5.8	5.4
5.0	5.3	6.2	6.0	6.7	6.0	5.9	6.2	5.6	5.5	6.6	6.5	5.8	5.2	5.6	6.9	6.5	7.2	7.6	7.6	7.3	7.0	7.1	6.3	5.9	6.5	6.4	6.8	7.2	7.7	8.1	7.3	7.0	6.6	5.2	4.9
5.7	5.7	6.3	6.2	7.0	7.2	6.0	5.8	6.1	5.6	5.0	7.0	6.2	5.1	6.0	5.5	5.3	6.3	6.5	7.0	6.9	7.1	6.4	5.7	5.4	4.9	5.5	6.7	7.9	8.9	8.9	7.9	7.4	6.1	5.2	4.9
4.8	5.7	6.9	7.5	7.9	8.2	7.7	7.1	6.7	6.1	6.1	7.3	6.8	6.5	6.4	6.3	7.2	6.5	6.4	6.6	7.2	6.2	4.8	3.8	4.1	4.9	4.4	4.6	5.0	5.6	6.0	4.1	3.6	2.8	4.5	4.0
5.1	5.6	6.1	6.9	7.4	7.1	6.6	6.2	5.0	4.7	4.1	3.7	4.0	4.0	3.5	3.7	3.7	4.0	4.7	5.0	5.1	4.3	4.2	4.3	4.3	4.5	4.3	4.1	3.9	3.4	3.4	3.4	3.3	4.5	5.1	4.6

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2001

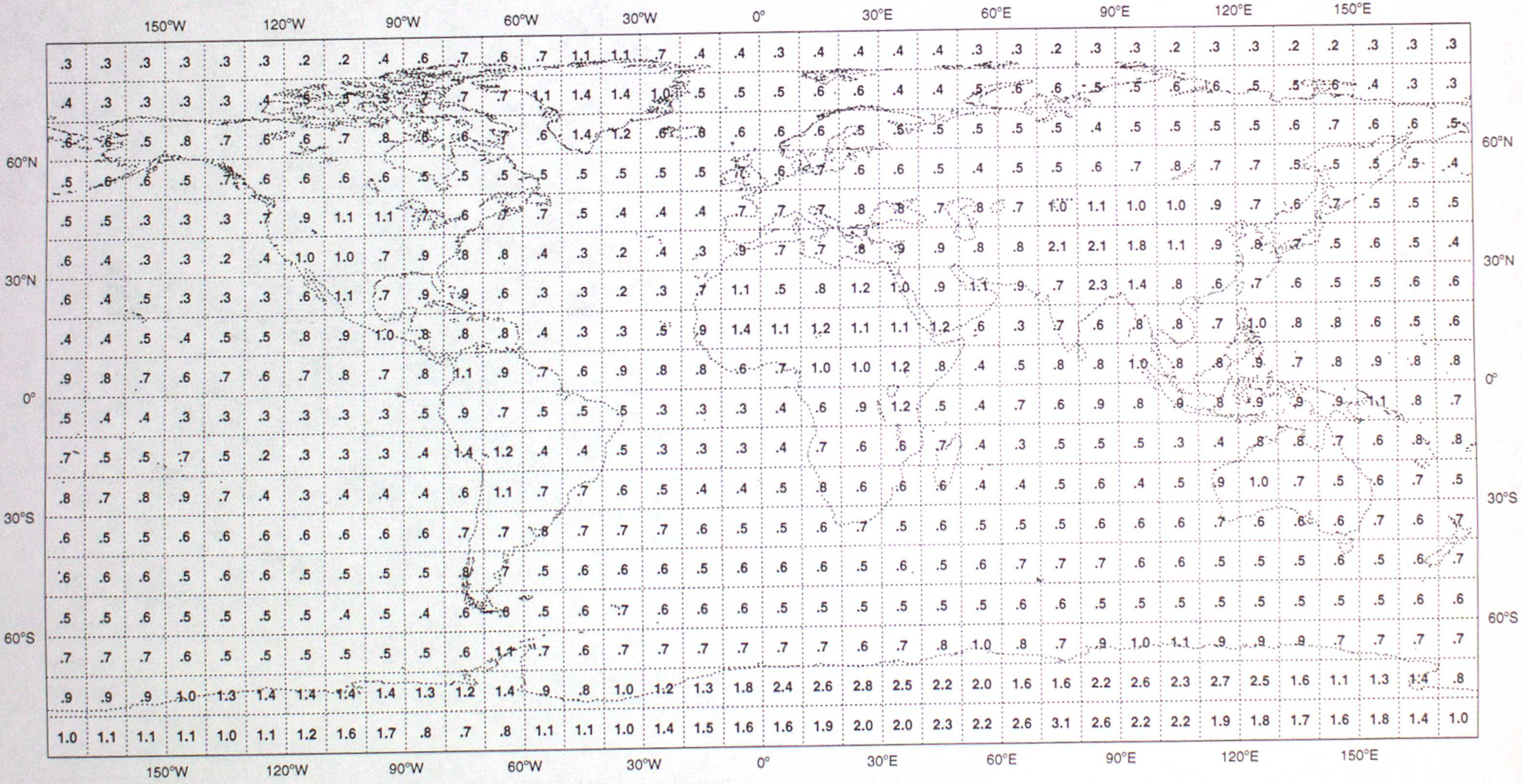
Channel: AMSUA-7 (300 hPa)

NOAA16, using all observations



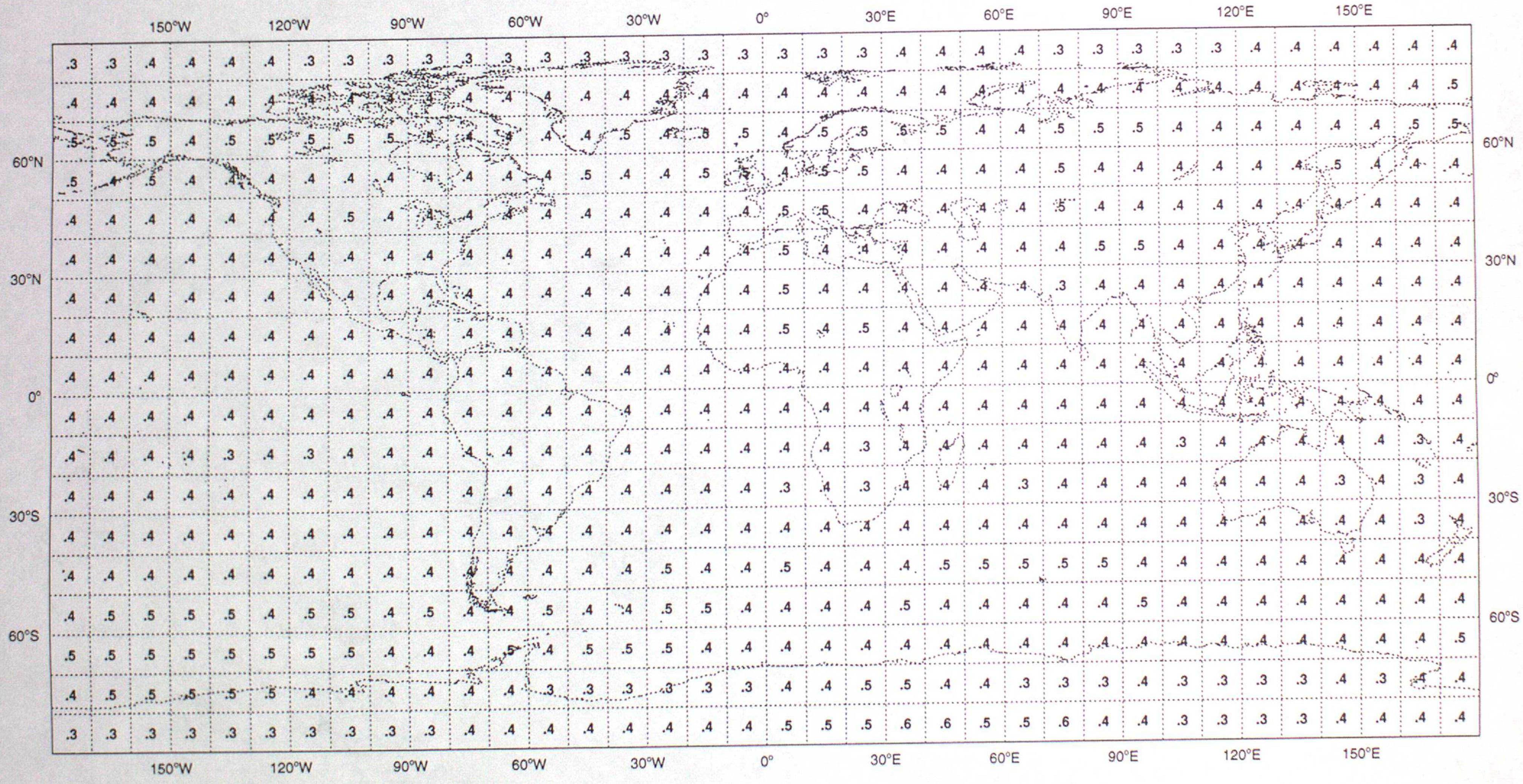
2.3	2.3	2.2	2.1	2.2	2.2	2.1	2.0	2.3	2.8	2.8	2.5	2.3	2.2	2.1	2.5	2.2	1.9	1.9	2.0	1.7	1.8	2.0	2.1	2.1	2.2	2.3	2.4	2.1	2.4	2.7	2.8	2.7	2.4	2.3	2.3
2.8	2.7	2.7	2.4	2.4	3.0	3.2	3.2	3.4	3.7	3.4	3.0	2.8	2.1	1.9	2.5	2.2	2.1	2.2	2.9	3.1	3.2	2.9	3.0	2.6	2.8	3.2	3.5	3.9	3.9	3.6	3.8	3.5	3.2	3.1	3.1
3.7	3.8	3.8	4.1	3.9	4.2	4.6	5.0	4.5	3.4	2.8	2.6	2.7	2.6	2.6	2.9	3.1	3.1	3.3	4.3	4.4	4.2	3.7	4.0	3.9	3.7	4.1	4.9	5.1	4.7	4.6	4.5	4.2	3.7	3.5	3.3
5.1	4.6	4.6	4.2	3.7	4.4	5.9	6.5	5.8	4.9	4.8	5.1	5.0	5.1	4.6	4.1	4.0	4.1	4.3	5.1	5.9	5.5	3.8	3.5	4.4	4.9	5.4	6.5	6.7	6.5	6.4	5.1	4.0	4.5	4.2	4.2
6.5	6.0	4.3	3.3	3.1	3.5	6.6	8.9	8.5	5.9	5.3	6.4	7.3	5.7	5.2	4.3	3.8	4.8	5.6	5.3	5.6	3.6	4.4	4.8	4.4	6.3	7.3	8.0	8.1	6.7	6.4	5.9	5.5	5.8	6.4	6.2
7.3	6.1	4.5	2.6	1.3	1.3	6.5	7.5	6.3	6.5	7.5	8.9	5.8	3.1	1.5	1.0	1.4	4.8	4.4	2.0	1.4	1.8	2.9	3.7	2.9	6.8	6.0	5.4	6.0	5.6	5.5	4.2	4.9	6.9	6.4	5.5
7.8	5.7	3.8	3.4	1.7	1.7	4.0	9.3	5.9	7.8	6.6	6.4	3.3	2.4	2.1	2.0	2.5	3.2	2.4	1.4	1.6	1.8	2.6	3.4	4.5	6.7	5.3	8.1	4.7	4.8	6.7	7.2	7.2	7.0	8.1	7.9
7.3	6.1	5.2	5.2	6.6	8.0	10.0	10.6	10.7	8.6	6.8	6.5	5.8	3.3	3.3	4.7	8.3	9.9	8.5	8.9	8.2	9.0	6.7	2.9	4.5	7.1	8.0	9.1	7.6	7.8	10.9	11.0	10.2	10.6	8.8	9.7
10.9	9.9	8.6	8.0	7.7	7.1	7.8	9.4	8.2	9.0	10.6	9.9	8.2	7.2	9.8	9.1	8.1	5.7	7.0	10.0	10.2	8.4	3.0	5.3	9.2	10.8	10.5	10.0	7.5	7.9	8.6	9.0	10.0	9.9	10.3	11.5
6.9	4.1	1.9	.9	.9	1.3	1.2	1.4	1.2	1.9	7.2	8.7	5.2	3.2	2.5	1.3	1.2	1.0	1.5	4.4	7.5	3.7	1.7	5.1	10.3	9.8	11.8	10.7	8.0	6.3	5.7	7.7	8.4	10.7	11.2	9.7
6.2	4.8	4.2	3.1	1.2	.8	.8	.7	.7	1.1	4.7	6.2	3.9	2.2	2.4	1.8	1.4	.9	1.2	1.7	1.7	1.7	1.4	1.2	2.6	3.4	5.5	4.8	2.1	2.0	2.8	2.6	3.0	6.3	8.3	8.7
5.3	7.1	8.3	9.4	8.2	6.1	4.3	4.3	4.2	3.1	2.7	4.6	6.0	5.4	5.5	5.5	3.1	1.2	1.2	2.0	1.9	2.0	2.1	1.4	1.1	2.7	3.3	2.5	3.3	3.1	5.1	4.8	3.4	4.4	6.4	6.5
6.4	6.9	7.0	8.1	8.8	8.0	7.6	7.0	7.2	6.8	6.9	7.6	7.7	8.2	8.0	7.9	6.5	5.2	3.7	3.9	4.0	4.1	4.6	3.4	2.7	2.9	3.4	3.4	5.2	5.3	4.2	3.8	4.4	5.9	7.0	5.8
5.4	5.4	5.5	5.1	5.0	5.6	5.4	4.9	5.3	5.8	6.4	6.6	6.7	6.1	6.6	7.2	6.0	6.8	6.2	6.2	5.5	5.2	5.2	5.3	4.9	5.1	5.3	5.1	5.6	5.6	5.0	4.4	4.6	4.8	4.8	4.2
3.5	3.4	4.2	4.3	5.1	4.4	4.7	5.0	4.7	4.5	5.3	5.0	4.4	3.9	4.2	5.2	4.6	5.5	5.8	5.7	5.6	5.4	5.6	4.9	4.6	5.1	5.0	5.3	5.6	5.9	6.1	5.6	5.3	5.0	3.8	3.7
4.2	3.9	4.2	4.1	4.9	5.0	4.2	4.2	4.6	4.3	3.7	4.8	4.5	3.7	4.2	3.7	3.6	4.4	4.7	5.2	5.2	5.2	4.5	4.1	3.8	3.3	3.8	4.7	5.7	6.6	6.8	6.1	5.5	4.5	3.9	3.7
3.2	3.7	4.6	5.0	5.3	5.7	5.2	4.9	4.6	4.1	4.4	5.0	4.6	4.3	4.0	3.7	4.5	4.1	3.9	4.1	4.6	3.9	2.2	1.5	2.3	2.8	2.2	2.1	2.6	3.3	3.8	2.5	1.9	1.4	2.4	2.7
3.0	3.5	4.0	4.3	4.5	4.3	3.8	3.4	2.7	2.8	2.4	1.9	1.8	1.6	1.5	1.4	1.4	1.9	2.5	2.8	2.9	2.3	1.8	1.7	1.8	1.8	1.8	1.8	1.7	1.7	1.6	1.7	1.6	2.2	2.6	2.5

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). JULY 2001
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations



.3	.3	.3	.3	.3	.3	.2	.2	.4	.6	.7	.6	.7	1.1	1.1	.7	.4	.4	.3	.4	.4	.4	.4	.3	.3	.2	.3	.3	.2	.3	.3	.2	.2	.3	.3	.3
.4	.3	.3	.3	.3	.4	.5	.5	.5	.7	.7	.7	1.1	1.4	1.4	1.0	.5	.5	.5	.6	.6	.4	.4	.5	.6	.6	.5	.5	.6	.6	.5	.5	.6	.4	.3	.3
.6	.6	.5	.8	.7	.6	.6	.7	.8	.6	.6	.7	.6	1.4	1.2	.6	.8	.6	.6	.6	.5	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.6	.7	.6	.6	.5
.5	.6	.6	.5	.7	.6	.6	.6	.6	.5	.5	.5	.5	.5	.5	.5	.5	.7	.6	.7	.6	.6	.5	.4	.5	.5	.6	.7	.8	.7	.7	.5	.5	.5	.5	.4
.5	.5	.3	.3	.3	.7	.9	1.1	1.1	.7	.6	.7	.7	.5	.4	.4	.4	.7	.7	.7	.8	.8	.7	.8	.7	1.0	1.1	1.0	1.0	.9	.7	.6	.7	.5	.5	.5
.6	.4	.3	.3	.2	.4	1.0	1.0	.7	.9	.8	.8	.4	.3	.2	.4	.3	.9	.7	.7	.8	.9	.9	.8	.8	2.1	2.1	1.8	1.1	.9	.8	.7	.5	.6	.5	.4
.6	.4	.5	.3	.3	.3	.6	1.1	.7	.9	.9	.6	.3	.3	.2	.3	.7	1.1	.5	.8	1.2	1.0	.9	1.1	.9	.7	2.3	1.4	.8	.6	.7	.6	.5	.5	.6	.6
.4	.4	.5	.4	.5	.5	.8	.9	1.0	.8	.8	.8	.4	.3	.3	.5	.9	1.4	1.1	1.2	1.1	1.1	1.2	.6	.3	.7	.6	.8	.8	.7	1.0	.8	.8	.6	.5	.6
.9	.8	.7	.6	.7	.6	.7	.8	.7	.8	1.1	.9	.7	.6	.9	.8	.8	.6	.7	1.0	1.0	1.2	.8	.4	.5	.8	.8	1.0	.8	.8	.9	.7	.8	.9	.8	.8
.5	.4	.4	.3	.3	.3	.3	.3	.3	.5	.9	.7	.5	.5	.5	.3	.3	.3	.4	.6	.9	1.2	.5	.4	.7	.6	.9	.8	.9	.8	.9	.9	.9	1.1	.8	.7
.7	.5	.5	.7	.5	.2	.3	.3	.3	.4	1.4	1.2	.4	.4	.5	.3	.3	.3	.4	.7	.6	.6	.7	.4	.3	.5	.5	.5	.3	.4	.8	.8	.7	.6	.8	.8
.8	.7	.8	.9	.7	.4	.3	.4	.4	.4	.6	1.1	.7	.7	.6	.5	.4	.4	.5	.8	.6	.6	.6	.4	.4	.5	.6	.4	.5	.9	1.0	.7	.5	.6	.7	.5
.6	.5	.5	.6	.6	.6	.6	.6	.6	.6	.7	.7	.8	.7	.7	.7	.6	.5	.5	.6	.7	.5	.6	.5	.5	.5	.6	.6	.6	.7	.6	.6	.6	.7	.6	.7
.6	.6	.6	.5	.6	.6	.5	.5	.5	.5	.8	.7	.5	.6	.6	.6	.5	.6	.6	.6	.5	.6	.5	.6	.7	.7	.7	.6	.6	.5	.5	.5	.6	.5	.6	.7
.5	.5	.6	.5	.5	.5	.5	.4	.5	.4	.6	.6	.5	.6	.7	.6	.6	.6	.5	.5	.5	.5	.5	.5	.6	.6	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6
.7	.7	.7	.6	.5	.5	.5	.5	.5	.5	.6	1.1	.7	.6	.7	.7	.7	.7	.7	.7	.6	.7	.8	1.0	.8	.7	.9	1.0	1.1	.9	.9	.9	.7	.7	.7	.7
.9	.9	.9	1.0	1.3	1.4	1.4	1.4	1.4	1.3	1.2	1.4	.9	.8	1.0	1.2	1.3	1.8	2.4	2.6	2.8	2.5	2.2	2.0	1.6	1.6	2.2	2.6	2.3	2.7	2.5	1.6	1.1	1.3	1.4	.8
1.0	1.1	1.1	1.1	1.0	1.1	1.2	1.6	1.7	.8	.7	.8	1.1	1.1	1.0	1.4	1.5	1.6	1.6	1.9	2.0	2.0	2.3	2.2	2.6	3.1	2.6	2.2	2.2	1.9	1.8	1.7	1.6	1.8	1.4	1.0

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). JULY 2001
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations



.3	.3	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5
.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.4	.4	.4	.4	.5	.4	.5	.5	.4	.5	.5	.5	.5	.4	.4	.5	.5	.5	.4	.4	.4	.4	.4	.4	.5	.5
.5	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.5	.5	.4	.5	.5	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.5	.4	.4	.4
.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4
.4	.4	.4	.4	.3	.4	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.4	.4	.4	.4	.4	.4	.4	.3	.4	.4	.4	.4	.4	.3	.4
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.4	.3	.4	.4	.4	.3	.4	.4	.4	.4	.4	.4	.4	.3	.4	.3	.4
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.4
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.5	.4	.4	.4	.5	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4
.4	.5	.5	.5	.5	.4	.5	.5	.4	.5	.4	.4	.5	.4	.4	.5	.5	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4
.5	.5	.5	.5	.5	.5	.5	.5	.4	.4	.4	.5	.4	.5	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5
.4	.5	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.4	.4	.5	.5	.4	.4	.3	.3	.3	.4	.3	.3	.3	.3	.4	.3	.4	.4
.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.5	.6	.6	.5	.5	.6	.4	.4	.3	.3	.3	.3	.4	.4	.4	.4

Figure 54. ATOVS SD O-B brightness temperature differences (deg C). JULY 2001

Channel: AMSUA-9 (100 hPa)

NOAA16, using all observations

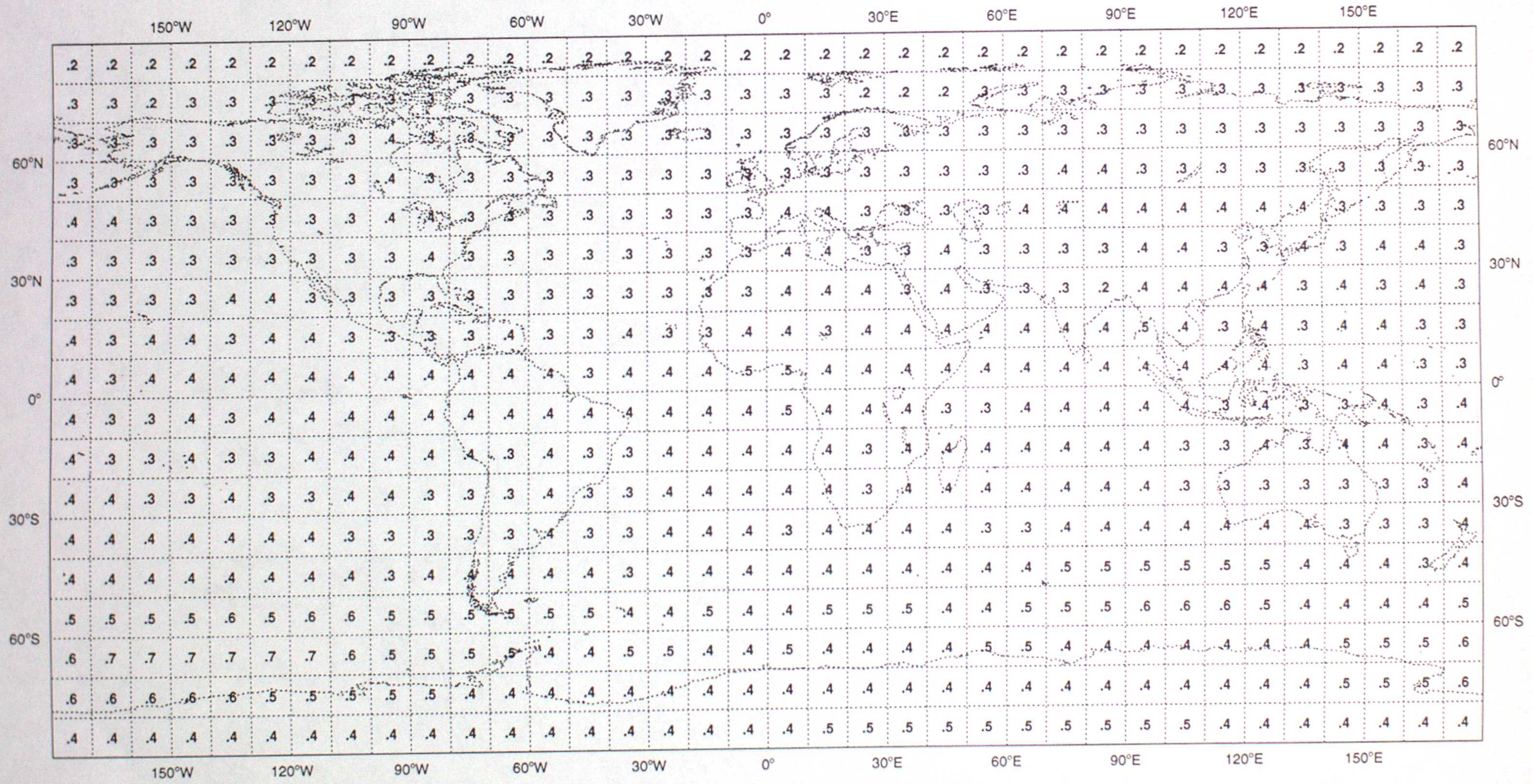

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2
.3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3
.4 .4 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .4 .3 .3 .3 .3 .4 .4 .3 .3 .4 .3 .4 .4 .3
.3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .4 .3 .3 .3 .2 .4 .4 .4 .4 .3 .4 .3 .4 .3
.4 .3 .4 .4 .3 .4 .4 .3 .3 .3 .3 .4 .3 .3 .4 .3 .3 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .5 .4 .3 .4 .3 .4 .4 .3 .3
.4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .3 .3
.4 .3 .3 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .3 .4 .3 .3 .4 .3 .4
.4 .3 .3 .4 .3 .3 .4 .4 .4 .4 .4 .3 .4 .3 .3 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .3 .3 .4 .3 .4 .4 .3 .4
.4 .4 .3 .3 .4 .3 .3 .4 .4 .3 .3 .3 .4 .3 .3 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4
.4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .4 .3 .3 .4 .4 .4 .3 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .4
.4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .4 .4 .4 .3 .4
.5 .5 .5 .5 .6 .5 .6 .6 .5 .5 .5 .5 .5 .5 .4 .4 .5 .4 .4 .5 .5 .5 .4 .4 .5 .5 .5 .6 .6 .6 .5 .4 .4 .4 .4 .5
.6 .7 .7 .7 .7 .7 .7 .6 .5 .5 .5 .5 .4 .4 .5 .5 .4 .4 .5 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .6
.6 .6 .6 .6 .6 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .6
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: July 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored :Mean sea-level pressure (hPa)
:Wind speed (m s^{-1})
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS :15 hPa (pressure)
:25 m s^{-1} (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA PRESSURE											
13502	22.0	-29.0	ALL	P	SUR	157	1	1	0.6	-0.2	0.6
13510	13.4	-16.8	ALL	P	SUR	28	0	0	0.5	-1.6	1.7
14601	44.7	-63.6	ALL	P	SUR	12	12	100			
14603	19.4	-81.4	ALL	P	SUR	10	9	90	0.0	-7.0	7.0
17537	44.7	-63.6	ALL	P	SUR	5	5	100			
17541	44.7	-63.6	ALL	P	SUR	10	10	100			
21604	25.4	-79.9	ALL	P	SUR	100	100	100			
21613	38.3	-77.1	ALL	P	SUR	30	30	100			
21628	38.3	-77.0	ALL	P	SUR	25	25	100			
26510	71.6	-21.6	ALL	P	SUR	196	0	0	1.4	1.0	1.8
33554	42.4	-71.2	ALL	P	SUR	2	2	100			
33557	42.4	-71.2	ALL	P	SUR	3	3	100			
35538	44.7	-63.6	ALL	P	SUR	10	10	100			
41502	24.6	-77.7	ALL	P	SUR	148	0	0	0.8	1.4	1.6
41504	23.2	-64.6	ALL	P	SUR	145	137	94	5.1	-6.4	8.2
41505	28.1	-64.4	ALL	P	SUR	201	0	0	1.0	-3.3	3.4
41523	32.0	-57.3	ALL	P	SUR	370	0	0	0.5	0.0	0.5
41525	18.8	-40.5	ALL	P	SUR	32	0	0	0.4	0.2	0.4
41528	18.9	-48.0	ALL	P	SUR	15	0	0	0.4	0.4	0.6
41552	19.8	-38.1	ALL	P	SUR	669	0	0	0.5	-0.7	0.9
41559	15.2	-44.7	ALL	P	SUR	624	0	0	0.5	-0.3	0.6
41560	15.5	-41.5	ALL	P	SUR	623	0	0	0.5	-0.3	0.6
41561	14.2	-41.8	ALL	P	SUR	621	0	0	0.5	-0.5	0.7
41562	11.5	-42.3	ALL	P	SUR	634	0	0	0.6	-0.3	0.6
41563	11.5	-31.4	ALL	P	SUR	640	0	0	0.5	-0.3	0.6
41571	38.6	-37.4	ALL	P	SUR	216	0	0	0.5	-0.2	0.5
41639	25.2	-63.9	ALL	P	SUR	204	0	0	0.6	1.5	1.6
41642	22.2	-65.0	ALL	P	SUR	293	0	0	0.6	0.4	0.7
41644	31.7	-40.9	ALL	P	SUR	407	0	0	0.5	0.2	0.6
41648	14.8	-83.3	ALL	P	SUR	3	3	100			
41650	24.6	-81.8	ALL	P	SUR	10	10	100			
44546	60.3	-22.6	ALL	P	SUR	679	0	0	0.7	-1.1	1.3
44548	51.8	-36.1	ALL	P	SUR	601	0	0	0.8	-0.4	0.9
44549	50.9	-42.3	ALL	P	SUR	743	0	0	0.7	-0.3	0.8
44550	51.1	-46.1	ALL	P	SUR	712	0	0	0.8	-0.7	1.0
44568	51.5	-31.9	ALL	P	SUR	1	0	0	0.0	-1.0	1.0
44610	59.6	-15.9	ALL	P	SUR	1247	0	0	0.8	-0.1	0.8
44611	43.7	-4.4	ALL	P	SUR	665	0	0	0.7	0.8	1.1
44612	36.8	-25.1	ALL	P	SUR	814	0	0	0.5	0.0	0.5
44613	35.1	-21.8	ALL	P	SUR	753	0	0	0.4	0.3	0.5
44616	42.6	-47.8	ALL	P	SUR	987	0	0	0.7	0.3	0.7
44620	26.7	-42.2	ALL	P	SUR	716	0	0	0.5	-0.1	0.5
44621	54.9	-45.8	ALL	P	SUR	941	0	0	0.8	-0.3	0.8
44623	36.1	-23.4	ALL	P	SUR	699	0	0	0.5	0.3	0.6
44624	42.9	-41.1	ALL	P	SUR	736	0	0	0.7	-0.1	0.7
44625	45.7	-52.8	ALL	P	SUR	816	0	0	0.7	-0.6	1.0
44627	49.2	-46.9	ALL	P	SUR	587	0	0	0.7	-0.8	1.1
44628	27.3	-42.3	ALL	P	SUR	1	0	0	0.0	-0.5	0.5
44721	40.0	-36.2	ALL	P	SUR	1188	0	0	0.5	0.0	0.5
44722	38.5	-32.2	ALL	P	SUR	834	1	0	0.4	-0.3	0.5
44725	51.5	-39.9	ALL	P	SUR	569	0	0	1.6	1.2	2.0
44729	45.3	-9.7	ALL	P	SUR	1057	0	0	0.6	0.4	0.7
44761	52.9	-19.0	ALL	P	SUR	926	0	0	0.7	-0.3	0.8
44762	45.3	-5.3	ALL	P	SUR	615	0	0	0.6	0.2	0.6
44765	37.2	-34.1	ALL	P	SUR	701	7	1	0.7	0.1	0.7
44770	57.2	-12.9	ALL	P	SUR	55	1	2	0.4	0.1	0.4
44771	55.7	-32.1	ALL	P	SUR	644	0	0	0.6	-0.1	0.6
44774	47.4	-16.8	ALL	P	SUR	619	3	0	1.0	-0.1	1.0
44775	37.9	-45.3	ALL	P	SUR	990	0	0	0.4	-0.2	0.5
44776	50.3	-32.1	ALL	P	SUR	682	0	0	0.8	-0.5	1.0

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
44778	44.8	-28.3	ALL	P	SUR	693	0	0	0.6	0.0	0.6
44825	40.3	-73.2	ALL	P	SUR	1	0	0	0.0	-0.3	0.3
44829	44.8	-9.8	ALL	P	SUR	1	0	0	0.0	0.8	0.8
45738	49.5	-65.8	ALL	P	SUR	1	0	0	0.0	-0.3	0.3
45803	45.4	-82.8	ALL	P	SUR	1	0	0	0.0	0.9	0.9
55595	55.8	-39.0	ALL	P	SUR	1	0	0	0.0	-0.3	0.3
55602	60.0	-25.2	ALL	P	SUR	1	0	0	0.0	-0.9	0.9
56808	24.9	-81.3	ALL	P	SUR	112	112	100			
62501	37.4	-20.6	ALL	P	SUR	659	1	0	0.5	0.5	0.7
62503	34.8	-15.9	ALL	P	SUR	1038	0	0	0.6	-0.3	0.6
62504	40.2	-23.5	ALL	P	SUR	680	0	0	0.6	-0.1	0.6
62505	35.5	-13.9	ALL	P	SUR	766	0	0	0.5	0.1	0.5
62510	42.4	-19.6	ALL	P	SUR	300	0	0	0.6	-0.4	0.8
62511	38.9	-23.4	ALL	P	SUR	417	0	0	0.5	-0.3	0.6
62514	58.0	-11.8	ALL	P	SUR	792	0	0	0.5	-0.5	0.7
62564	33.1	-15.0	ALL	P	SUR	199	0	0	0.5	0.3	0.6
62596	63.8	-31.8	ALL	P	SUR	680	0	0	0.7	-0.5	0.8
62703	49.9	-2.9	ALL	P	SUR	1	0	0	0.0	1.0	1.0
62705	54.9	-12.6	ALL	P	SUR	1	0	0	0.0	-0.1	0.1
62707	50.1	-1.5	ALL	P	SUR	1	0	0	0.0	-3.3	3.3
62863	47.5	-8.5	ALL	P	SUR	1	0	0	0.0	-0.6	0.6
64549	61.4	-35.0	ALL	P	SUR	25	0	0	0.5	0.4	0.6
64550	62.1	-27.4	ALL	P	SUR	37	0	0	0.5	0.3	0.6
65515	60.4	-34.9	ALL	P	SUR	1	0	0	0.0	-0.8	0.8
65516	60.5	-35.4	ALL	P	SUR	805	1	0	0.7	-0.5	0.8
65581	58.5	-37.7	ALL	P	SUR	510	0	0	0.7	-0.7	1.0
65595	56.2	-39.8	ALL	P	SUR	1223	7	1	1.0	-0.5	1.1
65602	59.7	-28.0	ALL	P	SUR	1859	8	0	1.1	-0.6	1.3
65662	59.7	-37.5	ALL	P	SUR	1663	3	0	1.2	-0.6	1.3
65663	53.1	-36.6	ALL	P	SUR	1183	5	0	1.3	-0.7	1.5
74536	42.4	-71.2	ALL	P	SUR	5	4	80	0.0	-14.5	14.5
WIND SPEED											
41523	32.0	-57.3	ALL	SPEED	SUR	1	0	0	0.0	-3.3	3.3
41552	19.8	-38.1	ALL	SPEED	SUR	663	0	0	1.2	0.0	1.2
41559	15.2	-44.7	ALL	SPEED	SUR	616	0	0	1.4	0.8	1.6
41560	15.5	-41.5	ALL	SPEED	SUR	615	1	0	1.9	0.5	2.0
41561	14.2	-41.8	ALL	SPEED	SUR	614	0	0	1.3	0.1	1.3
41562	11.5	-42.3	ALL	SPEED	SUR	630	0	0	1.8	0.8	2.0
41563	11.5	-31.4	ALL	SPEED	SUR	637	1	0	2.0	1.6	2.6
41639	25.2	-63.9	ALL	SPEED	SUR	198	1	1	4.4	5.8	7.3
41642	22.2	-65.0	ALL	SPEED	SUR	288	2	1	2.7	4.2	5.0
41644	31.7	-40.9	ALL	SPEED	SUR	1	0	0	0.0	-0.1	0.1
44825	40.3	-73.2	ALL	SPEED	SUR	1	0	0	0.0	0.9	0.9
45738	49.5	-65.8	ALL	SPEED	SUR	1	0	0	0.0	-0.7	0.7
62504	40.2	-23.5	ALL	SPEED	SUR	672	0	0	1.6	0.1	1.6
62552	47.0	-8.9	ALL	SPEED	SUR	475	0	0	1.3	-0.2	1.4
62556	39.1	-19.9	ALL	SPEED	SUR	544	0	0	1.3	-0.1	1.3
62559	46.6	-20.8	ALL	SPEED	SUR	531	0	0	1.7	0.0	1.7
62565	39.7	-13.3	ALL	SPEED	SUR	365	0	0	1.2	-0.4	1.3
62567	38.0	-17.1	ALL	SPEED	SUR	551	0	0	1.1	0.3	1.2
62569	37.1	-14.6	ALL	SPEED	SUR	510	0	0	1.1	0.1	1.1
62570	46.0	-21.6	ALL	SPEED	SUR	524	0	0	1.4	-0.4	1.5
62571	36.7	-13.6	ALL	SPEED	SUR	412	0	0	1.2	-0.2	1.2
62572	42.0	-20.1	ALL	SPEED	SUR	543	0	0	1.3	0.1	1.3
62703	49.9	-2.9	ALL	SPEED	SUR	1	0	0	0.0	-0.6	0.6
62705	54.9	-12.6	ALL	SPEED	SUR	1	0	0	0.0	-1.7	1.7
62707	50.1	-1.5	ALL	SPEED	SUR	1	0	0	0.0	4.5	4.5
62863	47.5	-8.5	ALL	SPEED	SUR	1	0	0	0.0	1.3	1.3

WIND DIRECTION

```
41552        19.8  -38.1  ALL   DIRN.  SUR  622  0  0  10.7   -0.2  10.7
41559        15.2  -44.7  ALL   DIRN.  SUR  554  0  0  11.5   -4.6  12.3
41560        15.5  -41.5  ALL   DIRN.  SUR  559  1  0  10.4   16.0  19.0
41561        14.2  -41.8  ALL   DIRN.  SUR  540  0  0  10.8   -3.1  11.2
41562        11.5  -42.3  ALL   DIRN.  SUR  404  0  0  19.9  -11.4  23.0

41563        11.5  -31.4  ALL   DIRN.  SUR  163  1  1  23.3   25.7  34.7
41639        25.2  -63.9  ALL   DIRN.  SUR  154  1  1  22.8  -11.0  25.3
41642        22.2  -65.0  ALL   DIRN.  SUR  269  2  1  23.7   15.3  28.2
44825        40.3  -73.2  ALL   DIRN.  SUR    1  0  0   0.0  -28.8  28.8
45738        49.5  -65.8  ALL   DIRN.  SUR    1  0  0   0.0   28.0  28.0

62504        40.2  -23.5  ALL   DIRN.  SUR  334  0  0  13.8   -0.2  13.8
62552        47.0   -8.9  ALL   DIRN.  SUR  219  0  0  16.6    0.2  16.6
62556        39.1  -19.9  ALL   DIRN.  SUR  249  0  0  11.9   15.3  19.3
62559        46.6  -20.8  ALL   DIRN.  SUR  310  0  0  13.1   -5.8  14.3
62565        39.7  -13.3  ALL   DIRN.  SUR  244  0  0  14.8   -7.1  16.4

62567        38.0  -17.1  ALL   DIRN.  SUR  347  0  0  10.8    7.8  13.3
62569        37.1  -14.6  ALL   DIRN.  SUR  356  0  0   9.9   -3.6  10.5
62570        46.0  -21.6  ALL   DIRN.  SUR  336  0  0  15.5  -16.4  22.6
62571        36.7  -13.6  ALL   DIRN.  SUR  298  0  0  11.6   -0.5  11.6
62572        42.0  -20.1  ALL   DIRN.  SUR  339  0  0  14.2    4.1  14.8

62703        49.9   -2.9  ALL   DIRN.  SUR    1  0  0   0.0  -20.4  20.4
62705        54.9  -12.6  ALL   DIRN.  SUR    1  0  0   0.0   -9.7   9.7
```

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: July 2001

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s^{-1} Vector Wind	
SELECTION CRITERIA	:N REP $\geq$ 20	

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	2572	0	5	1.6	0.0	2557	0	6	0	7.7	0.8
AAR	23	0	17	1.8	-0.3	21	0	19	0	6.7	-1.0
ACA	1898	0	3	1.6	0.0	1886	0	3	0	6.0	0.6
AEA	356	1	3	1.5	0.4	356	1	4	0	7.9	0.1
AEL	310	1	13	2.2	-0.1	315	0	12	0	6.7	0.1
AFL	513	1	3	1.9	0.7	508	0	5	0	8.2	0.3
AFR	1065	0	9	1.6	0.2	1080	1	10	0	7.6	0.3
AIH	201	1	4	1.5	0.1	206	1	6	0	8.5	0.1
AJM	129	0	5	1.2	0.0	129	1	4	0	5.8	0.2
ALM	85	2	15	1.1	0.5	85	0	18	0	8.4	-0.5
AMM	97	0	1	1.7	0.6	98	0	3	0	7.2	0.4
AMX	181	1	5	1.8	0.2	179	0	4	0	8.0	0.1
ANZ	47	0	79	1.6	-1.1	47	2	77	0	4.9	1.2
AVA	75	1	3	1.4	0.8	76	1	7	0	11.6	0.6
AZA	634	1	7	2.4	0.4	648	1	5	0	7.0	0.7
BAF	37	0	0	1.3	-0.7	39	0	0	0	4.8	0.9
BAL	133	1	11	1.5	-0.3	136	0	13	0	6.7	1.1
BAW	743	0	7	1.8	0.1	741	0	7	0	6.5	0.8
BBB	23	0	0	1.2	0.6	23	4	9	0	14.3	0.4
BLX	28	4	4	1.0	0.1	28	0	0	0	5.8	0.0
BWA	53	4	55	3.7	3.3	54	0	7	0	9.7	0.3
CFG	369	1	2	1.4	-0.6	373	1	3	0	6.3	0.3
CLX	313	0	4	1.8	0.1	319	0	5	0	6.9	0.5
CMM	536	0	4	1.6	0.1	534	0	4	0	6.3	0.8
COA	497	1	19	1.7	-0.1	488	0	20	0	9.6	0.3
CRL	369	1	4	1.5	0.4	375	0	5	0	8.6	0.5
CTB	46	0	0	1.1	0.6	46	0	4	0	7.0	-0.1
CUB	109	5	6	1.9	1.2	111	0	2	0	5.3	0.5
DAL	1362	0	18	1.6	-0.4	1377	0	17	0	7.2	0.3
DLH	1253	0	7	1.7	0.2	1239	0	7	0	6.6	0.8
EEZ	38	3	45	1.6	0.6	39	0	10	0	5.9	1.3
ELY	126	2	5	1.5	0.2	132	1	8	0	9.0	-0.2
ETH	31	0	16	1.0	-0.3	31	0	19	0	11.9	0.1
EWW	165	1	4	1.6	0.3	168	0	6	0	8.7	1.5
FDX	917	1	31	1.6	0.5	946	1	31	0	8.3	0.9
FIN	422	0	4	1.7	0.6	405	1	6	0	7.0	0.7
GAF	71	1	10	2.4	-0.6	74	0	8	0	9.4	1.2
GCO	97	0	6	2.0	0.9	98	1	100	0	17.9	4.0
GRL	36	0	3	2.2	0.9	35	0	0	0	6.5	1.8
GTI	69	0	9	2.9	-0.8	68	0	4	0	7.7	0.8
IBE	1380	1	9	1.5	0.5	1374	0	10	0	7.6	0.0
ICE	1080	0	3	1.7	0.3	1043	0	4	0	6.8	0.9
ICL	28	0	4	1.7	0.5	26	0	8	0	9.2	-0.5
JKK	287	1	5	1.5	0.0	269	0	4	0	7.6	-0.6
JMC	58	0	3	1.7	-0.5	59	0	2	0	6.2	-0.4
KLM	1228	0	6	1.5	0.1	1247	0	7	0	6.6	0.4
LDA	26	0	0	0.8	-0.1	27	0	0	0	3.7	0.0
LDI	324	0	3	1.2	-0.5	327	0	4	0	7.7	0.2
LIB	469	1	8	1.4	0.6	483	0	9	0	7.3	0.5
LOT	97	0	2	1.7	-0.5	98	2	6	0	6.8	-0.3
LTU	537	1	8	1.3	0.0	535	0	8	0	6.1	0.3
LXR	24	0	0	2.2	1.0	24	0	0	0	6.9	2.0
MAS	21	0	5	1.2	0.5	21	0	10	0	9.6	1.6
MON	62	2	5	1.9	-0.1	61	0	2	0	6.1	1.4
MPD	179	1	5	1.6	0.2	180	1	4	0	6.7	-0.1
MPH	348	0	2	1.8	-0.8	349	0	2	0	5.6	0.3
NCA	24	0	0	1.6	0.2	24	0	0	0	4.5	1.8
NWA	4113	0	2	1.7	0.4	4121	0	2	0	7.0	0.6
OAE	37	0	3	1.6	-0.4	39	0	23	0	16.3	2.4

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
PAC	117	0	5	1.9	-0.4	121	0	6	0	6.6	0.5
RAM	87	0	3	1.5	-0.6	87	0	2	0	6.3	0.1
RCH	52	0	92	1.9	0.7	56	0	100	0	13.9	3.1
RRR	91	4	11	2.2	0.6	94	0	9	0	6.5	0.1
RZO	158	1	1	1.2	-0.5	158	0	3	0	6.1	0.3
SAS	55	2	9	1.8	0.1	55	0	5	0	5.3	1.1
SLR	51	0	8	1.1	0.5	55	0	13	0	8.9	0.5
SVA	57	0	5	1.6	0.5	60	0	5	0	7.4	-0.2
SWR	43	0	9	1.8	0.4	42	0	12	0	10.9	1.8
TAG	20	0	5	2.7	-0.2	20	0	5	0	4.0	1.3
TAP	428	1	7	1.5	-0.1	431	0	6	0	6.9	0.5
THY	20	0	10	2.4	0.7	22	0	9	0	7.7	-1.9
TSC	215	1	2	1.3	0.2	211	0	4	0	7.0	1.7
TWA	247	1	6	1.5	0.2	240	0	5	0	7.0	0.7
UAL	1429	0	100	1.9	0.0	1417	0	100	0	5.8	0.8
UPS	945	4	39	1.7	0.1	944	0	36	0	8.3	0.6
USA	198	2	3	1.1	0.0	172	0	2	0	5.8	0.7
VIR	513	0	4	1.9	0.1	519	0	3	0	7.5	0.8
VPB	40	0	5	2.2	1.3	40	0	5	0	8.2	-1.3
WOA	41	2	2	1.6	0.4	43	0	0	0	6.3	0.5
YSS	43	2	9	1.9	1.3	46	0	11	0	8.1	1.5
EU	23750	0	25	1.3	0.0	23750	0	25	0	4.6	0.4
KL	2826	1	55	2.4	1.7	2811	0	53	0	6.3	1.3
LH	457	0	4	1.6	0.9	457	0	4	0	4.2	0.3
N	443	0	4	2.2	0.7	460	0	4	0	7.8	0.8
US ACARS	30349	10	36	1.4	0.4	30349	0	27	0	5.1	0.6

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: July 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :100 hPa.

Element monitored :GEOPOTENTIAL HEIGHT in metres

Parameters monitored :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	10	0	12.1	34.4	32.2
DBBH	12	Z	100	9	0	8.5	21.1	19.3
DBLK	12	Z	100	16	0	11.3	24.0	21.1
EHOA	12	Z	100	11	0	17.9	43.6	39.8
ELML7	00	Z	100	19	0	19.1	36.9	31.6
ELML7	12	Z	100	20	0	12.1	33.4	31.1
FNOR	00	Z	100	6	0	14.5	40.4	37.7
FNOR	12	Z	100	11	0	9.5	26.5	24.7
FNOU	00	Z	100	11	0	7.0	42.7	42.1
FNOU	12	Z	100	12	0	7.5	26.3	25.3
FNPH	00	Z	100	13	0	5.8	32.4	31.9
FNPH	12	Z	100	13	0	7.7	18.5	16.8
FNRS	00	Z	100	12	0	13.1	31.4	28.5
FNRS	12	Z	100	11	0	17.5	30.5	24.9
LDWR	00	Z	100	30	0	9.4	14.6	11.2
LDWR	12	Z	100	28	0	8.4	10.0	5.4
OVYA2	00	Z	100	4	0	8.4	26.6	25.3
OVYA2	12	Z	100	4	0	4.8	27.2	26.8
OXYH2	00	Z	100	8	0	7.7	9.6	5.8
OXYH2	12	Z	100	6	0	11.2	12.5	5.5
V2XO	00	Z	100	6	0	13.0	33.0	30.3
V2XO	12	Z	100	6	0	17.0	38.9	35.0
WPKD	00	Z	100	7	0	6.4	27.6	26.9
WPKD	12	Z	100	9	0	8.9	26.3	24.8
ZCBP6	00	Z	100	7	0	25.9	43.4	34.9
ZCBP6	12	Z	100	7	0	13.1	38.0	35.7
03953	00	Z	100	30	0	14.6	41.5	38.9
03953	12	Z	100	30	0	15.0	42.4	39.6
04018	00	Z	100	30	0	10.7	23.4	20.8
04018	12	Z	100	30	0	9.7	18.2	15.4
04220	00	Z	100	29	0	9.7	38.6	37.3
04220	12	Z	100	29	0	8.6	29.6	28.3
04270	00	Z	100	29	0	9.7	16.5	13.3
04270	12	Z	100	28	0	13.2	15.0	7.0
04339	00	Z	100	29	0	14.3	30.4	26.8
04339	12	Z	100	28	0	5.8	24.4	23.8
04360	00	Z	100	28	0	8.3	20.1	18.3
04360	12	Z	100	29	0	11.7	18.0	13.6
08001	00	Z	100	28	0	16.9	22.6	14.9
08001	12	Z	100	29	0	23.5	24.0	4.7
08508	00	Z	100	30	0	9.0	38.6	37.5
08508	12	Z	100	28	0	7.9	31.6	30.6
08522	00	Z	100	30	0	8.5	39.2	38.3
08522	12	Z	100	30	0	11.6	32.1	30.0
08594	12	Z	100	19	0	20.1	35.6	29.3
60020	00	Z	100	28	0	17.4	40.2	36.3
60020	12	Z	100	30	0	11.3	30.5	28.3
71600	00	Z	100	30	0	11.7	22.2	18.8
71600	12	Z	100	30	0	12.1	23.5	20.2
72201	00	Z	100	28	0	32.6	45.2	31.4
72201	12	Z	100	29	0	28.7	39.2	26.7
72402	00	Z	100	26	0	14.6	55.5	53.5
72402	12	Z	100	27	0	11.1	55.8	54.7
74494	00	Z	100	25	0	9.7	27.9	26.2
74494	12	Z	100	26	0	13.8	16.7	9.3
78016	00	Z	100	26	0	9.9	46.6	45.5
78016	12	Z	100	28	0	12.5	35.1	32.8

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: July 2001

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	500	11	0	11.7	15.0	9.4
DBBH	12	Z	500	9	0	4.6	8.8	7.6
DBLK	12	Z	500	19	0	9.2	15.3	12.2
EHOA	12	Z	500	11	0	9.0	18.0	15.5
ELML7	00	Z	500	19	0	9.4	10.7	5.2
ELML7	12	Z	500	23	0	6.9	12.5	10.4
FNOR	00	Z	500	9	0	6.2	8.9	6.3
FNOR	12	Z	500	12	0	5.4	8.4	6.5
FNOU	00	Z	500	12	0	5.1	9.9	8.5
FNOU	12	Z	500	13	0	7.0	8.5	4.8
FNPH	00	Z	500	16	0	7.4	7.5	1.0
FNPH	12	Z	500	14	0	7.5	8.0	2.9
FNRS	00	Z	500	12	0	5.4	6.5	3.7
FNRS	12	Z	500	11	0	9.6	10.5	4.4
LDWR	00	Z	500	30	0	8.0	9.5	5.1
LDWR	12	Z	500	29	0	10.3	10.4	-1.0
OVYA2	00	Z	500	4	0	19.0	19.8	-5.5
OVYA2	12	Z	500	4	0	7.0	9.9	7.0
OXYH2	00	Z	500	8	0	7.3	7.8	-2.8
OXYH2	12	Z	500	6	0	7.8	8.0	-1.8
V2XO	00	Z	500	6	0	7.7	15.3	13.2
V2XO	12	Z	500	6	0	8.4	20.0	18.2
WPKD	00	Z	500	7	0	6.6	6.7	0.3
WPKD	12	Z	500	9	0	5.7	8.4	6.2
ZCBP6	00	Z	500	7	0	21.4	23.2	9.0
ZCBP6	12	Z	500	7	0	7.4	14.3	12.3
03953	00	Z	500	30	0	7.7	15.2	13.0
03953	12	Z	500	30	0	6.8	14.1	12.4
04018	00	Z	500	30	0	7.7	18.7	17.0
04018	12	Z	500	30	0	9.8	16.0	12.7
04220	00	Z	500	29	0	7.3	14.3	12.3
04220	12	Z	500	30	0	9.5	14.2	10.5
04270	00	Z	500	29	0	7.6	8.6	3.9
04270	12	Z	500	29	0	8.3	10.9	7.0
04339	00	Z	500	29	0	13.1	24.4	20.6
04339	12	Z	500	29	0	6.1	16.2	15.0
04360	00	Z	500	29	0	6.5	9.1	6.4
04360	12	Z	500	30	0	7.6	8.6	4.0
08001	00	Z	500	28	0	12.4	12.4	0.4
08001	12	Z	500	29	0	14.1	14.8	-4.4
08508	00	Z	500	30	0	5.0	6.7	4.4
08508	12	Z	500	28	0	5.5	6.8	4.0
08522	00	Z	500	30	0	5.2	8.7	6.9
08522	12	Z	500	30	0	5.0	7.7	5.8
08594	12	Z	500	27	0	11.1	11.2	-1.0
60020	00	Z	500	29	0	7.0	7.9	3.6
60020	12	Z	500	30	0	7.6	10.9	7.8
71600	00	Z	500	30	0	7.8	8.8	-4.0
71600	12	Z	500	30	0	8.2	8.7	2.9
72201	00	Z	500	30	0	6.5	9.4	6.9
72201	12	Z	500	29	0	7.7	7.8	-1.4
72402	00	Z	500	26	0	7.1	9.1	5.8
72402	12	Z	500	29	0	7.0	10.3	7.6
74494	00	Z	500	25	0	7.6	8.0	2.4
74494	12	Z	500	28	0	6.3	6.6	1.9
78016	00	Z	500	26	0	5.9	13.5	12.2
78016	12	Z	500	30	0	8.7	15.4	12.6

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: July 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	9	0	0	3.6	0.1	-1.1
DBBH	12	V	100	9	0	0	2.3	-0.7	-0.5
DBLK	12	V	100	15	0	0	2.6	0.2	0.0
EHOA	12	V	100	9	0	0	4.8	-1.3	-1.4
ELML7	00	V	100	17	0	0	5.5	-0.6	-1.1
ELML7	12	V	100	18	0	0	6.0	-1.1	-0.3
FNOR	00	V	100	8	0	0	2.5	-0.1	-0.5
FNOR	12	V	100	9	0	0	4.3	-0.6	-1.2
FNOU	00	V	100	11	0	0	3.1	-0.5	0.9
FNOU	12	V	100	10	0	0	4.8	-1.2	0.5
FNPH	00	V	100	9	0	0	4.0	-0.4	0.0
FNPH	12	V	100	6	0	0	6.2	-2.7	-1.0
FNRS	00	V	100	9	0	0	5.4	-0.9	2.0
FNRS	12	V	100	5	0	0	2.2	0.0	-0.6
LDWR	00	V	100	30	0	0	2.3	-0.4	0.8
LDWR	12	V	100	28	0	0	2.3	-0.5	0.2
OVYA2	00	V	100	3	0	0	2.5	-1.7	1.5
OVYA2	12	V	100	4	0	0	3.7	0.3	1.4
OXYH2	00	V	100	8	0	0	3.2	-0.7	-0.3
OXYH2	12	V	100	6	0	0	3.0	0.1	0.4
V2XO	00	V	100	6	0	0	2.4	-0.5	0.3
V2XO	12	V	100	4	0	0	1.7	0.6	0.3
WPKD	00	V	100	7	0	0	2.9	0.0	0.6
WPKD	12	V	100	9	0	0	3.8	-0.5	0.9
ZCBP6	00	V	100	6	0	0	3.0	0.9	0.0
ZCBP6	12	V	100	7	0	0	3.4	0.9	0.5
03953	00	V	100	30	0	0	2.8	0.3	0.8
03953	12	V	100	30	0	0	2.4	0.8	1.1
04018	00	V	100	30	0	0	2.2	0.1	0.0
04018	12	V	100	30	0	0	2.0	0.3	0.0
04220	00	V	100	29	0	0	2.6	-0.5	-0.1
04220	12	V	100	29	0	0	2.2	-0.3	0.4
04270	00	V	100	29	0	0	3.0	-0.7	-0.2
04270	12	V	100	28	0	0	2.8	0.5	0.1
04339	00	V	100	29	0	0	4.2	0.6	-1.2
04339	12	V	100	26	0	3	4.4	-1.2	-0.6
04360	00	V	100	28	0	0	2.4	-0.4	-0.2
04360	12	V	100	28	0	0	2.6	-0.3	0.1
08001	00	V	100	27	0	0	3.8	1.0	-0.2
08001	12	V	100	28	0	0	2.6	0.5	-0.3
08508	00	V	100	15	0	0	4.7	-1.6	-0.2
08508	12	V	100	9	0	0	4.0	-1.4	-0.2
08522	00	V	100	28	0	0	4.3	-1.2	0.7
08522	12	V	100	29	0	0	3.7	-0.5	-0.3
08594	12	V	100	19	0	100	5.0	0.5	-1.7
60020	00	V	100	28	0	0	4.1	-0.1	0.5
60020	12	V	100	28	0	0	4.4	-0.8	0.6
71600	00	V	100	30	0	0	2.8	-0.1	1.0
71600	12	V	100	30	0	0	4.5	0.3	1.6
72201	00	V	100	28	0	0	3.4	1.8	-0.3
72201	12	V	100	29	0	0	3.6	1.2	-0.2
72402	00	V	100	26	0	0	3.7	0.1	0.2
72402	12	V	100	28	0	0	3.9	-0.1	1.1
74494	00	V	100	24	0	8	2.6	0.0	0.5
74494	12	V	100	25	0	8	3.1	-0.4	1.8
78016	00	V	100	26	0	0	4.1	-0.2	1.8
78016	12	V	100	28	0	0	3.9	0.0	-0.2

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: July 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	500	10	0	0	4.4	-0.5	0.7
DBBH	12	V	500	8	0	0	3.0	0.4	-0.4
DBLK	12	V	500	19	0	0	3.2	0.7	0.6
EHOA	12	V	500	9	0	0	3.8	-1.2	0.4
ELML7	00	V	500	18	0	0	2.9	-0.5	0.2
ELML7	12	V	500	21	0	0	4.3	0.7	1.2
FNOR	00	V	500	10	0	0	3.2	-1.7	1.1
FNOR	12	V	500	11	0	0	3.9	-0.1	0.6
FNOU	00	V	500	9	0	0	3.1	0.4	1.3
FNOU	12	V	500	11	0	0	3.8	-0.3	1.3
FNPH	00	V	500	11	0	0	3.6	-0.8	-0.6
FNPH	12	V	500	7	0	0	4.2	0.3	-1.7
FNRS	00	V	500	9	0	0	3.2	0.3	0.7
FNRS	12	V	500	5	0	0	4.0	1.5	-0.2
LDWR	00	V	500	30	0	0	3.2	-0.3	0.1
LDWR	12	V	500	29	0	0	3.2	-0.1	-0.3
OVYA2	00	V	500	2	0	0	2.7	-2.2	0.6
OVYA2	12	V	500	4	0	0	4.1	1.9	-0.4
OXYH2	00	V	500	8	0	0	4.7	0.8	-0.4
OXYH2	12	V	500	6	0	0	2.8	0.4	-0.7
V2XO	00	V	500	6	0	0	3.9	-0.2	1.6
V2XO	12	V	500	5	0	0	6.1	-2.1	-0.2
WPKD	00	V	500	7	0	0	4.1	-1.4	-1.3
WPKD	12	V	500	9	0	0	3.8	0.6	0.2
ZCBP6	00	V	500	6	0	0	5.4	0.2	-0.8
ZCBP6	12	V	500	7	0	0	2.9	-0.1	-0.6
03953	00	V	500	30	0	0	4.5	0.5	-0.2
03953	12	V	500	30	0	0	3.0	-0.4	0.4
04018	00	V	500	30	0	0	3.7	0.6	-0.3
04018	12	V	500	30	0	0	3.3	-0.2	0.4
04220	00	V	500	29	0	0	4.5	-1.0	-0.6
04220	12	V	500	30	0	0	4.3	0.1	-0.3
04270	00	V	500	29	0	0	3.5	0.1	-0.5
04270	12	V	500	29	0	0	3.3	-0.5	0.1
04339	00	V	500	28	0	0	5.5	0.1	-1.3
04339	12	V	500	29	0	0	5.2	0.2	-0.8
04360	00	V	500	29	0	0	3.1	-0.9	0.4
04360	12	V	500	30	0	0	4.3	-0.4	-0.4
08001	00	V	500	28	0	0	4.7	0.7	0.2
08001	12	V	500	29	0	0	3.8	0.4	-0.6
08508	00	V	500	14	0	0	2.8	-1.0	-0.2
08508	12	V	500	9	0	0	4.0	-1.1	-0.5
08522	00	V	500	30	0	0	2.9	-0.4	-0.1
08522	12	V	500	29	0	0	3.8	0.1	0.7
08594	12	V	500	27	0	100	4.3	0.4	-1.5
60020	00	V	500	28	0	0	4.0	0.5	-0.1
60020	12	V	500	30	0	0	3.9	0.7	0.6
71600	00	V	500	30	0	0	4.1	0.2	-0.3
71600	12	V	500	30	0	0	3.6	-0.5	1.1
72201	00	V	500	30	0	0	2.4	0.1	-1.1
72201	12	V	500	29	0	0	2.8	-0.3	-0.8
72402	00	V	500	25	0	0	3.2	0.3	-0.8
72402	12	V	500	30	0	0	3.0	0.2	-0.3
74494	00	V	500	24	0	8	3.5	-0.4	0.3
74494	12	V	500	25	1	8	2.8	-0.9	0.8
78016	00	V	500	26	0	0	3.8	-1.0	1.2
78016	12	V	500	30	0	0	3.6	-0.3	0.9

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45